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LECTURES
ON
AMPUTATION,
AND ON THE
Nature, Progress, and Terminations of the Injuries for which it is required.

(Delivered at Sydenham Coll. Med. School.)

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LECTURE XX.

SUMMARY OF RESULTS.

PART I.

Object of the present series of lectures stated. How endeavoured to be attained. Necessity for care and discrimination in the materials employed. These forming the elements for any judgment upon the questions involved in amputation, and by which they are to be decided. True objects of amputation classed and defined. RESULTS *on the system, of those forms of chronic local disease for which amputation is adopted. Results of the injuries of civil life for which amputation is usually performed. Results of the injuries of military life, in like manner treated to the end without operation. Modifications in the results induced by varying conditions, moral and physical. Causes, or diseased actions, which lead to amputation under different circumstances, compared with the causes of death. Causes of variation in the relative proportion of amputations required, and of deaths occurring while cases are under treatment.*

I PROPOSE in this concluding lecture to give a summary of the principal results of the inquiry which you have followed, step by step, into the *nature, progress,* and *terminations* of the *more complicated forms of injuries of the extremities,* when submitted to *treatment;* and, finally, of the *results of amputation,* when performed at *primary, intermediary, or secondary periods,* by different operative methods, and under different influences, physical and dynamic. I purpose to bring before you at the same time, in a condensed form, the *principles of practice* these results are calculated to establish, and the legitimate bearing of the facts upon some of the *leading doctrines of the present day in relation to amputation,* its relative expediency and efficacy at different periods, and the treatment of grave and complicated injuries of the extremities.

In commencing this series of lectures, I proposed to myself an object certainly not hitherto attained. I believe that you will find an inquiry, such as we have been engaged in, similar in aim and scope, and carried out in all its details, had not previously been attempted. But if I thus seem to claim any merit for the attempt, I beg you to believe that my labours were undertaken with no feeling of overweening confidence, but with a full consciousness of all the difficulties of my task. I have been impelled chiefly by a strong conviction of the importance and scientific interest attached to the subject. And on this ground have I ventured to engage at such length your attention. I must beg you also to believe that I recall the circumstances at this moment, conscious that my best efforts in this almost untrodden path have fallen far short of my wishes, and of the exigency of the subject. Yet the opportunities I have had of studying the effects of injuries and operations have been unusual, and seemed to justify the attempt.

Many years a principal medical officer in two services, during which I was entrusted alike with the duties of the field in every action, and with the organisation and direction of all the hospitals required for the sick and the wounded of the auxiliary forces engaged, it was not less a pleasure than an imperative duty, to devote every hour not actually spent in the field, or on the line of march, to the study and treatment of the cases, medical and surgical, filling large hospitals, and for the efficient care of which I was justly held responsible. Perhaps I am indebted to the flattering confidence which entrusted me with such heavy and responsible duties at an earlier period of my professional life, than in ordinary circumstances is usual, not only for enlarged opportunities of studying disease and injury in all its aspects, but for that zest and devotion to the labour it entailed, which I always felt and believed to be the only adequate return I could make.

Under these circumstances, at first insensibly, and later, as the result of continued efforts directed to that end, I found materials accumulate of the most valuable kind, consisting of records of cases, experiments, and observations, and of preparations of morbid structures, which, in their number and varied nature, might seem surprising, collected as they were in the course of the most arduous services, during the late civil wars of the Peninsula; unless it were stated, as it is my pride at all times to acknowledge, that it was my peculiar fortune in these duties and labours to be aided and seconded by a most zealous and indefatigable medical staff.

To Mr. Gannon and Mr. Blair, in Portugal; to the former also in Spain; and to Drs. Johnstone and Dolce; to Messrs. Sholl, Dorset, and A'Beckett, Staff-surgeons in the Force, and to the Medical Officers generally, I should be ungrateful, indeed, if I alluded to the collected scientific results obtained from the numerous hospitals of the two services (and be supposed to claim any merit from them), if I did not, even at the cost of a digression like the present, give them back the ample share which is so justly their due. The results and the facts, embodied in these and other lectures delivered here, were collected under my directions, and placed in my keeping, only by their efforts united to my own. I consider them held in trust, therefore, not to be used for my own exclusive benefit, nor without due acknowledgment.

One of the peculiar difficulties I have felt throughout these lectures, I explained to you in my last, viz., that I had felt compelled to lead you through the *steps of the inquiry*, and to furnish the *materials* for the investigation, since I could not refer you to any already existing, instead of confining myself, as I should otherwise have done, to *results* only. My object in this concluding lecture, therefore, is to separate from the mere process of inquiry the *results* actually obtained, and present them to you as unencumbered by details as the nature of the subject will permit, and in a clear and lucid order.

The object of the inquiry through which I have conducted you in these lectures, was to ascertain and determine what were *the effects of amputation upon the system*, uncomplicated by disease or injury, and the true *causes of mortality*; the *effects of amputation when the operation was superadded to the forms of pre-existing disease, or injury*, for which it is most usually performed; and, lastly, what were the *circumstances and conditions* moral, dynamic, and physical, which determined the *relative degrees of mortality or success* found to mark the operation in practice.

If the object were attainable, it is obvious that in proportion to the certainty and precision with which these bases were fixed, would be the accuracy with which we could predict the result of amputations, according to the predominant conditions and influences, and determine the safest practice to be pursued, whether the surgeon should rely upon treatment or resort to amputation; and if the latter, at what period in what mode, and under what conditions, the operation could most successfully be performed.

That by any means a power could be obtained of determining with perfect certainty, in each *individual case*, that any given result would follow a given course pursued by the surgeons in reference to it, is not to be imagined. Such fixed results, however, attainable in the mass, are clearly beyond our reach, in the individual or in any fractional portion, except when our materials are formed of inert matter, subject to no variation in the laws by which each part and the whole are governed. Each part of the mass, that is, each individual of the human species presents, on the contrary, an infinite variety of conditions and powers of resisting, of reacting upon, and of modifying the influences to which they are subjected. A law that will produce an unerring and unvarying result upon a thousand, would in that number produce an almost infinite variety of results if the individual parts were each analysed.

It is thus evident that we cannot determine a rule of practice, or a principle of medicine applicable to the whole, by the observation of individual cases, and deductions from one or two of these must not be relied upon, for they lead to the most contradictory, vacillating, and erroneous conclusions. This only can be obtained by combining the observation and the records of a large number, arranging them according to predominating influences, and analysing the results thus ascertained. The first classification must be founded upon the largest and broadest characters, and gradually in the spirit of analysis, subdivided in reference to the minor characteristics and differences down to the last link, comprising the details of an individual part. A true principle can only thus be legitimately developed, or with certainty determined—not liable to change, because fixed on a basis of facts, sufficiently large to give it solidity—not liable to be upheld one day and subverted the next by the breath of a bold assertion, because a superstructure thus raised can only be successfully assailed by a doctrine equally largely based, all its parts inviting and bearing the test of scrutiny and analysis.

Principles, then, let me repeat, are calculated to give certainty to the practice of medicine *applied to the mass*; no stretch or power of human intellect can determine with equal certainty the *results of individual cases*. By applying and testing principles by their effects on the mass, we gain the same relative power conferred by a microscope; everything, to the minutest action and effect, is enlarged in its proportions to such a vast degree, that we can appreciate the smallest

resemblance and differences, thus rendered gross and palpable. Statistics may better be illustrated by reference to the manipulations of a scientific chemist, ten thousand fractional parts aggregated into one, gives a mass sufficiently large to produce appreciable and definite results in the crucible, each of which, from their larger proportions, can be submitted to various tests, until their real nature is determined with precision and with the utmost certainty: whereas the same process by no art can be successfully applied to an unit, or a grain's weight, still less can any intermediary result be tested and analysed in various ways, under different conditions and influences, until a conviction of truth and accuracy in one fixed product is obtained.

In this spirit, upon these grounds and on this principle, should statistics be applied to medicine; and thus applied and understood, they form a means of advancing science, yielding in none, hitherto applied in efficiency, value, and importance. Neither certainly can they boast of any exemption from labour: they are not to be approached carelessly, or to be taken up by snatches, and again laid down. To elaborate a series of conclusions on which general principles may be constructed, requires long and patient efforts to collect facts, which form the minute particles to be aggregated. To form a sufficient mass for the crucible, they must be faithfully observed and discriminated, otherwise fragments of different materials are added to the matter to be tested, and falsify the whole of the results. The facts are, so many grains of gold, each requiring the same care and discrimination in its collection and elimination from all earthy or extraneous matter in connection, which may often bear some analogy, and yet be essentially different in character and properties. When these separate parts or particles, by a continued series of efforts, amount in the aggregate to a sufficient mass to admit of analysis, the results must be submitted to various tests, by modifying the circumstances, by the combination of various other elements, &c. This process in itself is one requiring the utmost care and conscientiousness, otherwise, however carefully selected may have been the materials, the results may be full of error.

I have here given you a description of my own task, and of the various steps of the inquiry we have prosecuted together; the conclusions I have laid before you were none of them foregone: I placed the materials I had been years in collecting into the crucible before you, analysed them even to their last elements, and then declared to you the legitimate results. To thus submit materials to this process, it was imperative that I should myself have collected them, not that others might not have performed this part better and more amply, but that no such facts, in complete series, with all their various characters and conditions, essential to their classification and analysis, existed in the records of surgery, without the aid of which I must necessarily have abandoned the enterprise.

I might, however, have given you, like the scientific chemist, the mere results in the last combination and the most concentrated form. My first idea was to do this, shrinking from the possibility of wearying with a detail of the whole of the processes by which they were elaborated, and the tests and materials employed. But when the chemist wishes to introduce any new combination of elements, from which he derives a result differing in some properties from any others previously admitted in the laboratory, he feels it is not sufficient to state the fact that he has obtained a result, but he details the elements employed, the analysis by which he proves them to be those, and no others; the combinations they assumed, and the various tests to which he subjected them, and under what conditions of temperature or external relations, generally, such tests were applied; that all might judge, and not he alone, whether these were capable of bringing new influences to bear, not contemplated by the manipulator, and consequently giving admission to sources of fallacy in the results. Moreover, if the whole process be delicate, complicated, highly susceptible of sources of fallacy, requiring an aggregate mass of material difficult for any single individual to collect, before the result can be fully established, and take its place among the fixed products, it is highly desirable that it should be made public, that it may be elaborated by others elsewhere, with the united aid of many, to produce a mass of evidence sufficiently large to inspire confidence, and indeed a certain conviction of the accuracy of any result obtained, from such an aggregate of material, by competent inquirers.

Influenced by these considerations, I have gone through the whole of the process with the mass in my hands, not so large as I could wish, but collected and sifted with great care. If any one doubt the accuracy of the results, the competency of the processes, or of the amount of the mass subjected to the crucible, and all are open to discussion, I shall hail with great pleasure the efforts of others to attain the same end I have in view. I shall rejoice in those efforts, assured that truth will be obtained, and that fixed principles of practice, in reference to the more important operations of surgery, will supply the place of loose conclusions, based upon erroneous premises; and that the present rules of practice which, whether they may prove right or wrong, are at all events founded upon imperfect analogies; general impressions of imperfectly-recorded and often contradictory experience; and numerical results, either too small in number, or when large, without the necessary guaran-

tees of their completeness and accuracy, to warrant the development of a general principle.

Amputation involves many questions of the highest importance; to decide any one of which certain materials are required to form the elements of judgment; elements not to be acquired by reference to the result of cases of amputation merely. To determine the advantages or expediency of amputation, under various conditions, we must be able to compare its effects with those arising from local disease, and from the forms of injury which usually require amputation, treated under similar conditions; and from those arising from amputation simply, where no pre-existing disease or injury existed, yet performed under a certain similarity of relation and condition. We can only thus, by the knowledge of the separate effects of each, attain the power in complicated conditions and injuries, to anticipate in some instances, and in others to appreciate the combined effects, and to understand their relation to each other, and the causes put in action.

Unvarying precision and entire certainty can rarely, if ever, be attained in medicine, where subtle vital powers form a part of the materials, as it were, on which we are to reason. But in determining and anticipating the progress of disease, how much have we attained, within the last century, that before seemed impossible! How, surely, may we rely upon the truth of certain general rules and bases of prognosis; not always in individual cases, but fully on any large number. As we see in all nature's schemes the perfect similarity of means adopted, under similar circumstances, to produce similar effects, we are warranted in assuming that in the human body, if we can with precision define similarity of circumstance, and of means (in the form of morbid actions which take place), we may also certainly define from these data the end or effect which will result.

In reference to the results of injuries of the extremities and of amputation, the attempt to obtain this power has scarcely hitherto been made; and the present effort, recorded in all its steps in these lectures, imperfect in many of its parts, from the impossibility of the experience of any one individual, how large soever his field of observation, supplying all the wide range of facts required in sufficient number, has at least sufficed, I trust, to convince you that the object in view is fully attainable—that it only requires the *correct and complete records*, during a few years, of some of the chief hospitals, military and civil, in this and other countries, in relation to the cases usually requiring amputation in civil and military life, to furnish the desideratum.

The results, and, so far as possible, results only, which I now propose to recapitulate, and in as simple a form as may be attainable with perspicuity, in treating of a subject branching necessarily into a number of secondary, but not the less important parts or subdivisions, may be classified in reference to the purposes for which amputation is employed.

Surgeons resort to amputation with many different objects in view—thus to be defined.

Classification of Objects to be attained by Amputation.

1. To remove a limb, useless from original malformation, or from contractions or deformity induced by disease or injury of remote occurrence, such disease or injury having left no trace in the system or health of the patient. To remove, in other words, a limb which produces inconvenience in a locomotive sense, but is not calculated to give rise to disturbance or deterioration of health, how long soever the limb may be permitted to remain. This forms the smallest class—amputations without the contemporaneous existence of disease or injury to modify the effects of the operation upon the system, and may be called *Amputation for Deformity*.

2. To remove a limb which, from local disease of a part, or the whole of its textures, leaves no rational ground of hope that the limb will ever be restored to health and vigour, or be made useful to the patient, however long permitted to remain; while the continuance of the disease, on the other hand, for an indefinite period, is calculated seriously to disturb the system, deteriorate the health, and ultimately endanger and shorten the life of the patient — *Amputation for Chronic Disease*.

3. To remove a limb at once, when so severely injured as either to be clearly incurable, or so likely, by its effects on the limb and the system, to destroy life before any hope can be entertained of completing the reparative process, that the attempt is not deemed justifiable; thus anticipating any effects depending on the progress of diseased actions in the shattered limb, and their influence on the system, constituting the class of *Primary amputations*.

4. To remove a limb during the first twenty days of treatment, which has been severely injured—not to anticipate the first effects, which have, on the contrary, been allowed to supervene, but to avert the ultimate result of those effects when they threaten to be fatal, or have so far added to the local injury, as to leave no hope of a more favourable period for amputation, or the possibility of cure, if longer retained. These supervening actions are often of specific and well-defined character, such as secondary hæmorrhage, gangrene, partial disorganisation from excessive suppuration, &c. And inasmuch as the operation is performed in the intermediate period between the non-supervention of febrile action and its subsidence, usually shortly after the full establishment of the suppurative processes, these cases may be denominated *Intermediary amputations*.

5. To remove a limb which, from the effects of an injury while under process of treatment (and after the febrile action first induced has subsided), is shown to be incurable—certain to prove useless, even if union take place; and if longer allowed to remain, to involve the system generally in disease, leading to a fatal result. These constitute *Secondary amputations*, properly understood and defined, and exclusive of the *Intermediary*, defined in the last class.

These five classes of cases, supplying causes for amputation, evidently comprise, each in their outline, many sources of influence upon the *progress* and *result* of the operation.

In the first class, indeed, we must evidently look for the *effects of the operation* pure and unmixed upon the system, exposed only to such influences as act upon the subject before operation; and upon all not amputated, and treated in the same locality. Here we test the influence of amputation, and test the effects of *different modes of amputation and of site*, whether performed on the upper or the lower extremity.

The second class gives the effects of the operation, in combination with the effects of a local disease, upon the system, in the majority of long continuance.

The third, fourth, and fifth, give the effects of the operation superadded to the previous shock, more or less recent; and in the fourth and fifth, in addition, the effects of local diseased actions. The effects of the operation are thus complicated by the effects of the injury, according to the period elapsing from its infliction.

To anticipate the result of the most complicated combinations, we must be well acquainted with each separate class of effects. Hence the necessity of an inquiry into the effects of chronic and local diseased actions of the extremities upon the system: the same of the injuries of different nature, extent, and degree, and in different sites treated under different conditions of external circumstances. This inquiry concludes the FIRST PART of the subject.

The SECOND PART leads us to the effects of amputation, *per se*, on a healthy frame, and to the effects of the operation when superadded to a long-continued chronic local disease. These classes of results afford us the means of determining the relation between the effects and results of amputation, in those cases where amputation is performed for injuries, at three different periods from the receipt of the wound, and when the two (effects of injury and of amputation) are consequently in combination. The results of each singly may be compared with the results of both combined. This forms the true subject of the *second part*. The first part you will find comprised in the first ten lectures: the second in the remaining nine.

Effects of Chronic and Local Diseased Actions of the Extremities upon the System.

The diseased actions usually leading to amputation, are those only which interest us especially; but these are various. Diseased joints, the majority scrofulous, form by far the largest proportion. Caries, necrosis, tumours, gangrene, ulcers, are the chief forms in the remainder.

Dr. Hayward gives an account of all the diseases for which amputation was performed subsequent to the opening of the Massachusets Hospital. These amputations amounted to 47 on 45 patients.

		Died.
20	for diseases of joints	3
15	ulcers	1
4	frost-bite	0
3	abscess and fungus	1
2	fungus hæmatodes	0
2	tumours	1
1	deformity	0
47		6

Mortality 1 in 7.8.

Only 5 of this number were of the upper extremity; and 2 of these were diseased joints.

In Dr. Lawrie's record of amputations for disease in the Glasgow Infirmary, the numbers amounted to 153; and 98 were performed for diseased joints; 26 for caries and ulcers; necrosis and tumours, 12 each; gangrene, 5. 1 in 5 of the diseased joints amputated were of the upper extremity, although still more than half of the whole number were of the *knee*.

Dr. Norris reports from the Pennsylvania Hospital, that in 23, the total cases amputated for disease in a given period, only 5 were of the upper extremity. The mortality in the lower extremity, 1 in 4.5; in 5 of the upper, none.

Of the final results of any number of these cases of local disease *treated without amputation, the proportionate mortality*, or the *causes of death*, there is no statistical record, so far as I know, to enable us to draw any very positive conclusions. Speaking from general experience, however, I have little hesitation in saying, that the more usual terminations of diseased joints, ulcers, caries, and necrosis, is hectic fever, occasionally accompanied by disease of the viscera, of the lungs more especially, and the mucous membranes of the intestines. Gangrene, malignant tumours, and fungus hæmatodes terminate somewhat differently: if spontaneous gangrene, the fever developed is very generally typhoid, the patient passing rapidly from delirium to a state of coma. With malignant diseases and tumours, the same form of morbid action is frequently developed in some distant part, often involving, directly or indirectly, some important viscus: at other times, the patient sinks, with hectic or irritative fever,

worn out at last with the incessant drain and irritation kept up, exhausting all the powers of life.

As the cases for which amputation is recommended are always deemed incurable, we may consider that all, sooner or later, lead to death by these diseased actions, if life be not cut short by the more sudden appearance of some fatal and irregular action.

Thus much for the effects on the system of the local diseases for which amputation is usually performed. We may safely conclude that the diseased actions do not kill rapidly; patients linger for years, living for half a lifetime with ulcers, tumours, and even diseased joints and caries; yet all that are incurable ultimately hasten, and not only indirectly, but often in a direct manner, the death of the patient.

Effects upon the System of Complicated Injuries of the Extremities occurring in Civil and Military Life.

Leaving the class of chronic diseases of the extremities, and their effects upon the system where any actions set up are in the majority of cases characterised by little intensity, and kill rather by the gradual exhaustion of the system from long-continued waste and irritation, than by the development of sudden and fatal supervening diseases during treatment. What did we find the effects of severe injuries of the extremities fracturing the bones, crushing and lacerating the soft parts, to be, when they are treated without the intervention of amputation? What is the proportionate mortality, and what the causes of death?

Cases of injury in their progress present a vivid contrast to the cases of chronic disease. As the morbid state in injuries is sudden in its supervention and violent in its characters, so are the diseased effects resulting neither mitigated in form nor slow to destroy: that an injury to the extremities is more dangerous than a chronic disease, becomes the first and inevitable inference. Whatever dangers amputation may bring, we are thus informed, therefore, that *they are superadded to a class of cases often rapidly fatal without its aid or intervention*. In diseases requiring amputation, the site or nature of those actions is of comparatively little importance—not so in injuries. Many circumstances and conditions require consideration in determining the effects upon the system of injuries, which exercise but an obscure or trifling influence on the progress and results of cases of disease.

Different classes of injuries give different results. There is a difference to be observed even between the injuries of civil and of military life, where fracture of bone and laceration of soft parts may alike be the chief features of the case. Our statistics on the result of injuries in civil hospitals are very imperfect; the two American hospitals to which I have alluded, and the Glasgow Infirmary, alone afford any collected data to which I can refer, and these are far from being as complete as could be desired.

In reference to the results of treatment without amputation adopted for injuries of civil life, I am only able to refer you to Dr. Lawrie's paper singly among the records of surgery, for a few data in a collected form.

In 40 compound fractures and dislocations treated and not amputated, 17 died; giving a mortality of 1 in 2.3 in the lower extremity, and of 1 in 2.2 in the upper. The diseased actions supervening and causing death is not stated.

It is remarkable that in this series the upper extremity gives a mortality even greater than the lower.

In reference to the injuries of military life, chiefly gunshot, the largest number recorded showing the *mortality* of injuries of military life (where one or more bones of the extremities are broken with laceration of soft parts), we owe to the conviction of the fatal results of amputation entertained by the surgeon-general of the Prussian army in 1762, M. Bilguer. In 816 gunshot fractures of the extremities received into the hospital under his direction at one time, in no single instance was amputation permitted.

Of this series (in round numbers) *one-half* died; *one-fourth* lived, retaining crippled and useless limbs: *one fourth* alone were returned cured, able to do duty in person, or to work at any trade.

Of the diseased actions causing death, nothing is said. This deficiency, however, in the preceding lectures, I have supplied by the results of another series of cases treated in hospitals under my own direction.

In reference to the mortality and disability resulting in this series consisting of 235 cases, including 55 partial fractures of the bones of the extremities, you have seen that 82 were amputated.

38 of which were followed by death.
38 of the remainder died under treatment.

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The mortality was 1 in 3—one-third.

And more than half of these cases of death without amputation were induced by vital actions, disturbed, impaired, and finally arrested *without organic disease or lesion of structure*; the remainder with affections of viscera, often purulent depôts, and various accidental or irregular actions, such as secondary hæmorrhage, gangrene of limb, &c.

115 recovered with useful limbs—say one-half.
44, or somewhat more than one-fifth, recovered, but crippled by the removal of a limb.

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Thus the united *favourable result*, as regards the question of *life*, is the recovery of 1 in

1.48, or two-thirds of the whole number, including the results of amputation.

The united *unfavourable* result, considering the loss of life or of limb as both unfavourable, the latter closely corresponding with M. Bilguer's *invalids*, will be 120 cases in 235, or 1 in 1.9—say *one-half*.

If *partial* fractures, however, be excluded, and those injuries which only secondarily involve the integrity of the articulations (both less fatal classes of injuries), and in the 235 amounting to 55, we find 1 in 1.5 was the combined unfavourable result of the gravest character of injuries, or two thirds; 1 in 2.4 losing their lives between one-half and one-third, and 1 in 4.2 their limbs only; a fourth, therefore, crippled. Still the mortality is considerably less than one-half; and the fourth crippled are free from the permanently diseased state of a shattered limb, which remains not only u less in a locomotive sense, but hurtful to the patient's health.

Thus, in reference to Bilguer's experiment, the worst result where amputation was performed in a large proportion of the worst cases, and many performed under most unfavourable circumstances, *is a considerable saving of life*; and no greater proportion of "maimed" results, all are in a *better* state by the removal of the limbs, than if they had been allowed to retain them, and survived; while one-third instead of one-fourth are returned cured to their occupations. I have taken here, I believe, as unfavourable a series as well could be selected to compare with Bilguer's series; the result, therefore, is the more conclusive and striking. If the 34 cases of death under treatment had been amputated at an early period, at a very low average, more than one-half would have been saved, thus adding from 18 to 29 to the 42 saved with loss of limb, reducing the actual loss of life from 73 to 53, or 1 in 3.4, between *one-third and one-fourth*; the maimed without disease to 62, or 1 in 2.7, between *one-half and one-third*. The cured retaining useful limbs remaining as before, *one-third*.

If the cases treated in one of the hospitals under my charge during a period of thirteen months (the series comprising complete fractures with lacerated wounds, and nearly one-third of which were injuries involving large articulations), to the exclusion of partial fractures and cases where the joints were only secondarily involved, be analysed (see Tables I. and II.), it will be found that 100 cases remained and were treated to the end after the whole series of 180 had been weeded, as it were, by 43 primary amputations, and 37 (generally of the worst cases) had also been eliminated from the 137 at first submitted to treatment by secondary, or at least subsequent amputations, 34 still died of the 100, giving a mortality of 1 in 3.

This seems to be as favourable a view, therefore, as can be taken of the result of these injuries when treated; and if amputation be not resorted to, rarely less than half will perish, and while from *a third to a fourth* may be cured and retain useful limbs, the remainder with *useless and crippled limbs* and shattered health will be left to drag on a very painful residue of life; the maimed limb, unlike a healthy stump, proving a pregnant source of future disease and discomfort.

In conclusion, then, it seems by such evidence as can be obtained, that the mortality of complicated injuries of the extremities, whether in civil or military life, if treated, is rarely likely to be less than one-half, when upper and lower extremities are in about equal proportion, and not more than one-third are joint cases. In addition to this, a considerable number preserve only shattered and useless limbs; the loss of useful limb and of life taken together, cannot be estimated at less than two-thirds of the whole number treated. If the average were applied to the upper extremity alone, the deaths would probably be 1 in 7 or 8 only; but if to the lower, as much as 1 in 1.7; and thus varying, according to the modifying conditions already applied, to the series of 100 cases.

The result of not amputating is to alter the proportion of dead to the crippled, increasing the former, and by the same number diminishing the latter; in addition to which the maimed are left more or less suffering for life by the limb retained, in addition to the total loss of the use of the limb.

Are we to conclude from these large results that it is always expedient to amputate, and that an advantage as clear and evident will always result over the practice of treating such injuries? May we venture to state the positive advantage gained, under all circumstances, to be as stated above?

The preceding lectures must have amply proved how full of sources of fallacy are such broadly-stated statistical results, and how vain is any reliance on their undeviating accuracy. These results, you are already aware, therefore, are *true only as regards certain conditions and proportions*. Change any one of these, and the results are changed! To arrive at a close approximation to truth, and to correct averages applicable to any series of cases, we must know, and be in a position to determine, what is the mortality and what the diseased actions causing death in cases of fracture under various conditions and proportions to each other and the whole; and be enabled to compare these analysed or isolated results with the mortality and diseased actions supervening in amputations under similar circumstances, before we can solve any of the questions connected with the operation, its comparative mortality and expediency.

Several lectures were devoted to demonstrate to you how infinitely any general average of mortality varies, and what the different rates were, according,—

First. To the *site of injury*, whether involving upper or lower extremity.

Secondly. To the *nature* of the injury, its *degree* and *extent*.

Thirdly. To the nature of the *external circumstances* prevailing during the treatment of the case.

Reference to the analysis already given of this 100 cases, will show that the average, if all the cases were under any one of the conditions just stated, would be completely changed. Thus it is the correct average on 100 cases, and probably would not vary much in any other 100 where similar proportions exist of injuries of upper and lower extremity; of joint cases, and of fractures merely; of favourable or unfavourable cases for treatment, and treated under similar circumstances. Until surgeons will thus classify their cases, no correct average can be stated: that which is correct of one combination of these leading distinctions, is utterly incorrect if applied to another, and a different classification.

A glance at this summary of results, classed after strict analysis in reference to the predominance of these three leading circumstances or conditions, show, in the most obvious manner, the idleness of any attempt to establish averages except in relation to them.

			UPPER EXTREMITY.			LOWER EXTREMITY.		
No. of Cases.	Deaths.	Mortality.	No. of Cases.	Deaths.	Proportion.	No. of Cases.	Deaths.	Proportion.
30 injuries to joints with fracture.....	18	1 in 1.6	13	3	1 in 4.3	17	15	1 in 1.1
70 compound fractures not involving joints....	16	— 4.3	39	4	— 9.7	31	12	— 2.5
100	34	1 in 2.9	52	7	— 7.4	48	27	— 1.7

These few figures express and embody very important results. The mortality in 100 cases of complicated injuries of the extremities, according to the usual mode of stating it, is 1 in 2.9, or say *one-third* of the whole number treated. You cannot doubt after this evidence that such an average, although strictly correct as regards the series in question, is yet entirely subject to a variety of conditions and proportions; and that if these are altered, the average on the mass is totally inapplicable and incorrect.

This fact has been enforced and demonstrated in several lectures; let us take a review of some of the chief results and their bearing upon this part of our subject.

If the cases treated were all wounds involving joints of the same relative number of upper and lower extremity, and treated under the same circumstances, the proportionate mortality would be..... 1 in 1.4

If all were fractures in the same manner with the single difference of not involving joints..... 1 in 4.4

Instead of *two-thirds*, less than *one-fourth* perish. Again:—

If all the injuries were of the upper extremity, similar in their degree and other circumstances (one-third being of joints), the mortality would be..... 1 in 7.7

If all of the lower extremity (one-half joint cases)..... 1 in 1.7

If, on the other hand, all were injuries of joints in the upper extremity..... 1 in 4.3

If all were fractures without injury to joints..... 1 in 9.7

If all were of the lower extremity and injuries of joints..... 1 in 1.1

If all were fractures without injury to joints..... 1 in 2.4

Nothing can be more palpable, striking, or obvious, than the modifications in the results induced by site, and this one distinction in the nature of wounds, viz, whether implicating an articulation or not.

But it has also been demonstrated to you, that if a series of cases were treated under favourable circumstances or under unfavourable circumstances, or a series of favourable cases for treatment, and a series of doubtful and again of unfavourable cases were submitted to treatment, every one of these conditions would produce a no less striking difference in the average number of deaths. A summary of the results brought forward in preceding lectures and in detail, in reference to these conditions, can leave no room for d oubt.

	Site.	No. of Cases.	Deaths.	Mortality.	Total Mortality.
Injuries involving Joints, doubtful or unfavourable cases for treatment—*external circumstances favourable*	Upper extremity	6	1	1 in 6.	2.2
	Lower ditto	5	4	— 1.2	
Compound Fractures not involving Joints—similar injuries to the above, with this distinction only, and treated under similar circumstances	Upper extremity	2	2*	— 1.	3.0
	Lower ditto	4	0	0 in 4	
Joint Cases—similar character, but treated under *unfavourable circumstances*	Upper extremity	7	2	— 3.5	1.4
	Lower ditto	12	11	— 1.0	
Fractures—ditto	Upper extremity	6	2	— 3.0	1.5
	Lower ditto	12	10	— 1.2	
Compound Fractures—favourable cases † treated under *favourable circumstances*	Upper extremity	16	0	0 in 16	0 in 18
	Lower ditto	2	—	0 in 2	
Similar class of cases treated under *unfavourable circumstances*	Upper extremity	17	0	0 in 17	14.
	Lower ditto	11	2	1 in 5.5	
		100	34	Up. extremity 1 in 7.7 Lower ditto 1 in 1.7	1 in 2.9

This summary shows at a glance that these important conditions, viz., the nature of the wound, the site, and the external circumstances under which the cases are treated, exercise a decided influence; it also furnishes the means of determining the proportionate amount of influence of each of these conditions upon the mortality. We are warranted, therefore, in the following conclusions:—

In reference to the Influence exercised by the Nature of the Injury and the External Circumstances.

First. Injuries directly implicating any of the large articulations, from the ankle and wrist upwards, are all more or less doubtful, and often decidedly unfavourable, cases for treatment: lacerated wounds into joints attended with partial or complete fractures, can only be compared with fractures of the worst kind; and even thus classed, and when both are treated under similarly *favourable* circumstances, the mortality in the former class is largely increased, especially in the lower extremity, when the deaths in cases of joint injuries is nearly quadruple that occurring from fractures simply. In the upper extremity the present series does not afford any fair criterion; but I have always found in doubtful cases that the mere fact of an articulating surface being implicated was sufficient to turn the balance unfavourably.

Secondly. This difference between the results of fractures implicating, and the more grave cases of fractures not implicating joints, so palpable and evident when both are treated under *favourable* circumstances, is almost lost when both classes are treated under *unfavourable* circumstances. Notwithstanding the mortality in the class of injuries to

* Both with complicating wounds of chest.

† Under the denomination of *favourable cases for treatment*, none of the compound fractures of the *femur* are included, such cases never *being favourable*; and so of lacerated wounds into joints with fracture of bones. The *favourable cases*, therefore, are exclusive of *fractures involving joints*, and of *compound fractures* of FEMUR, the two most fatal classes of injury.

joints is increased nearly one-half in the upper extremity, and in a lesser degree in the lower, yet the mortality in bad cases of fracture is increased in a so much larger proportion, that the difference between the results of the two classes of cases in the aggregate is only a minute fraction, the mortality being as 1 in 1.4 to 1 in 1.5. The proportions in the upper and lower extremity maintain about the same relative rate in both classes; injuries of joints in lower extremity being slightly more fatal.

In cases of injury of joints the upper extremity gives a mortality of .. 1 in 3.5
In the lower extremity ..... 1 in 1.0
In fractures not implicating an articulation, upper extremity .... 1 in 3.
In ditto, lower extremity .. 1 in 1.2

Thirdly. In reference to favourable cases of fracture for treatment, large numbers, it is here shown, are required to determine the relative influence of external circumstances upon the mortality, since it is rarely heavy. The series brought forward only shows that the mortality in the upper extremity is not 1 in 16; in the lower, not 1 in 2, when treated under favourable circumstances. In the upper extremity it is not 1 in 17, and only 1 in 5.5 in the lower, when the circumstances are unfavourable.

Fourthly. Hence the ultimate conclusion at which we arrive is that, in reference to the mortality, the influence of external circumstances is greatest upon favourable and doubtful cases for treatment, and of site upon doubtful cases. Neither site nor external circumstances, nor any distinction in the nature of the injuries, when these are sufficiently grave to constitute a class of cases unfavourable for treatment, exercise any important influence on the mortality, inasmuch as all prove fatal.

An incurable injury of the forearm, if treated to the end without amputation, is likely to prove as fatal a case as any similar injury in the lower extremity. A badly plastered, useless, and painful limb, is the nearest approach to a successful result that can possibly follow; the great majority of patients will die under treatment.

These are the last results of the facts, and they inculcate the following

Principle of Practice.

In favourable cases for treatment, the attempt to conduct them to a cure with the view of saving a useful limb, is always to be attempted wherever the injury be situate, whatever its description, or the nature of the external circumstances. In doubtful cases the nature of the external circumstances, and the *site* of the injury, when chances of cure and danger of failure are equal, as regards the *nature* and *extent* of the injury, decide the question: if situated above the knee, and the external circumstances are unfavourable, the balance is by those two conditions turned against the patient; and if treatment be undertaken, it should be with this knowledge, and not at the recommendation of the surgeon, as calculated to save a useful limb. In cases unfavourable for treatment, wherever the injury be situate, and whatever be the condition of external circumstances, only one of two results are to be expected—the death of the patient, or the loss of the limb by subsequent disease or by amputation. The broken-down invalids who occasionally escape death, still retain a useless limb.

I have hitherto been speaking of the results of injury as regarded mortality alone, and in cases where amputation is not allowed to intervene in any stage, and the influence which the three principal conditions exercise upon it, and not upon the *nature of the diseased actions* supervening and proving the immediate *cause* of death; still less have I yet brought before you the conclusions arrived at in reference to the varying proportions of cases under the influence of such conditions requiring amputation, when the surgeon is willing to resort to it during the progress of treatment, and of those which allow no opportunity, and therefore perish.

This, however, is necessary, in order that the dangers attendant on treatment, and on amputations performed at three different periods in similar injuries and under similar circumstances, may be ultimately brought out and contrasted, and the principles of practice, in reference to the more complicated cases of injuries to the extremities, determined.

Nature of the Diseased Actions causing Death.

In reference to the diseased actions causing death in cases treated and not amputated, and the influence which the three conditions specified as affecting, in a remarkable degree, the mortality, may have upon the character of these actions, a very different result is obtained.

The *character* or *nature* of the supervening fatal actions are not materially affected by the degree or nature of the injury, its site, or the external circumstances under which the cases are treated, if we except that injuries of joints do not seem equally prone to induce secondary inflammations and purulent depôts in vital organs or distant parts.

The causes of death may, therefore, be taken on the whole series of 34 fatal cases of complete fracture, and 4 of partial fracture. Fever was the predominant diseased action in 21; 18 of defined character, viz., 10 hectic, 5 remittent; continued, intermittent, and irritative, 1 each; 5 were attended with secondary diseases of viscera, which probably, from the symptoms, existed in 4 more. In 2 of the 21, also, the limbs were gangrenous.

Seventeen deaths occurred by what I have termed "*accidental and irregular diseased actions*;" such as shock, tetanus, hæmorrhage, complicating wounds in other parts; 5 of this

number presenting, in addition, secondary inflammations of lungs or liver; 3 died in which the causes were unascertained.

The conclusion from these data, examined in great detail, let me recall to your memory —it was this. The mortality was caused in more than half the fatal cases, by actions leaving no trace of structural change or physical lesion, by deleterious impressions made upon the nervous centres, disordering the circulation, and deranging the vital functions. In the remainder of the fatal cases, the same influences were sufficiently manifest, although in a less striking manner, since they were accompanied with lesions of structure, local and organic, chiefly secondary diseases involving distant parts, and often important organs, in suppurative and inflammatory actions, sufficient to account for the death of the patient.

In any series of cases, submitted to treatment in the first instance, (but amputations performed during the progress of the case, whenever the supervening diseased actions, local or general, indicate the hopelessness of any further attempt to save a limb, the condition of the patient still allowing such an alternative,) the proportion of amputations required; and of the cases which terminate fatally among those remaining under treatment, it will be found, is not less strikingly changed, according as the cases fall under one or other of the leading conditions, the influence of which has been already shown, in reference to the mortality of cases submitted, from the beginning to the end, to palliative or curative treatment.

The proportion of deaths to amputations caused by the supervening actions in 137 (the number comprised in the series of *complete* fractures, and exclusive of partial fractures and of injuries to joints, only secondarily and indirectly implicated), is as 1 in 3.7 to 1 in 4. The latter being the proportion of deaths in all the cases not amputated.

A source of fallacy exists in the average thus taken, however, not only because it varies in the two classes of injuries, but in the injuries of the upper and lower extremities, which are not in equal proportions; the results, therefore, require to be stated in the following manner:—

Class.	No.			Proportion.	No. of Amputations.	Proportion.	Deaths—not Amputated.	Proportion.	Proportion of combined unfavourable Results of Treatment.
Fractures.....	93	Upper extremity.....	30	1.8	11	4.5	4	1 in 12.5	15	1 in 3.3
		Lower extremity.....	43	2.2	12	3.5	12	— 3.5	24	1 in 1.7
			93		23	4.0	16	— 4.3	39	1 in 2.3
Fractures with Primary Injuries to Joints	44	Upper extremity.....	16	2.7	3	5.3	3	1 in 5.3	6	1 in 2.6
		Lower extremity.....	28	1.5	11	2.5	15	— 1.8	26	1 in 1.0
			44		14	3.1	18	— 2.4	32	1 in 1.3
	137		137		37	3.7	34	1 in 4.0	71	1 in 1.9

It will be perceived that the proportion of amputations in fractures, when of the upper extremity, is three times that of deaths; while in the lower extremity, the proportion of deaths and amputations are equal: but the upper compared with the lower, shows the amputations in the former are only 1 in 4.5, instead of 1 in 3.5; while the deaths in the upper are only 1 in 12.5 as compared with 1 in 3.5. The combined unfavourable results accruing from the treatment of fractures is just *doubled* in the lower extremity, *the amputations being somewhat fewer, but the deaths nearly quadrupled.*

The cases of injuries of joints, compared with each other and with the preceding class, show the combined unfavourable results in both upper and lower extremities to be considerably larger: this difference being in equal proportions, however, on both upper and lower, and caused principally by the excess of deaths, compared to amputations. Fewer amputations are performed in the upper extremity for joint injuries than for fractures, but the proportion of deaths is more than doubled. Nearly one-third more amputations, on the contrary, are performed in joint cases when of the lower extremity, and the proportion of deaths is only just doubled.

The variation or difference in the proportion of amputations in each of the two *classes* of injury is from one-third to one-fourth; the former being the proportion in fractures implicating joints.

The relative proportions between those required by the upper and lower extremity in each varies. In injuries of joints, a greater proportionate number is required in the lower extremity compared with the upper, than in the class of fractures only.

The variation in the proportion of deaths in

each of the two classes is greater than the aggregate difference in the amputations. The proportion in joint injuries being between one-half and one-third, that in fractures *one-fourth:* in the former, however, the cases present nearly double the proportion of lower extremities. Still the mortality, which is *more* than doubled in joint injuries of the upper extremity, is increased just double in the lower. The difference is not, therefore, very sensible; but the deaths decrease in proportion as the amputations increase.

These proportions you are prepared to find again vary with the favourable and unfavourable nature of the injury, and the external circumstances under which treated.

In reference to the external circumstances, amputations are in larger proportion under favourable circumstances, and *vice versa;* and as the *amputations decrease*, the *mortality* in the cases treated *augments*. Thus, under different circumstances, amputation and death change their relative proportions; the one occupying, as it were, the other's place. But while unfavourable circumstances only diminish the number of *amputations* as much as *one-half*, the *deaths* become nearly *quadrupled* in the remainder of the series treated.

You have already had before you the altered proportions of amputations under the combined conditions of favourable nature of injury and of circumstances. Let me repeat it.

Fractures not involving Joints.

	Proportion of Amputations.	Proportion of Deaths.
In favourable cases treated under favourable circumstances	1 in 4	in 18 0
Ditto under unfavourable circumstances	1 in 1.7	1 in 16.
Doubtful cases under favourable circumstances	1 in 1.4	in 4 0
Ditto unfavourable	1 in 2.	1 in 3.
Unfavourable cases under favourable circumstances	1 in 2.8	1 in 1.0
Ditto unfavourable circumstances	1 in 6.2	1 in 1.

Thus amputations are most numerous in doubtful cases treated under favourable circumstances; next in favourable cases treated under unfavourable circumstances; thirdly, in doubtful cases under unfavourable circumstances. Although one-fourth of the favourable cases treated under favourable circumstances seems a very large proportion, it will cease to appear so when it is recollected that no primary amputations were performed in this class, and no death occurred among those not amputated; thus one-fourth expresses the combined unfavourable result.

The deaths are most numerous in proportion to the number of amputations in unfavourable cases; whatever the nature of the circumstances, all the cases were fatal. Doubtful cases, under unfavourable circumstances, stand next in proportion: lastly, favourable cases under unfavourable circumstances. In the class of doubtful and favourable cases remaining for treatment under favourable circumstances, there were no deaths. On these facts were founded the three conclusions:—

1. That when circumstances are favourable for treatment, and the cases, from their nature, offer a fair chance of recovery, although a fourth may require amputation by the development of morbid actions, few or none will die under the treatment adopted, with a view to save the limb. Even in doubtful cases, although a large proportion, say one-half, may require amputation, yet few or none will die under the previous treatment if carefully watched, and amputation be not deferred too long. But in the treatment of unfavourable cases under the best circumstances, not a third will allow of amputation after the first period has passed, and all not amputated will perish. A portion of those operated upon who recover will be nearly the only ones saved.

2. When the circumstances under which the treatment must be conducted are unfavourable, the number of amputations in doubtful and unfavourable cases for which there is opportunity, with a fair chance of success, is much diminished; and the number of deaths is increased in proportion. In favourable cases the number of amputations is, on the contrary, largely increased, and the deaths in a lesser degree. The opportunities for amputation are most rare in unfavourable cases under unfavourable circumstances. On the deaths which take place in all not amputated in this class, external circumstances have no control, at least in so far as the *result* is concerned, although they possibly, in some degree, modify and control the character and duration of the supervening diseased actions.

3. From these general facts the last conclusion may be drawn, viz., that in favourable and even in doubtful cases, judicious treatment, if it will not always save the limb, at least need not cost the patient his life (unless in exceptional cases), if good judgment be exercised in stopping the curative treatment, and resorting to amputation at the proper period. Thus, in doubtful cases, much may be adventured, in the first instance, to save a useful limb. In unfavourable cases, on the contrary, amputation or death, sooner or later, are the only results that can be anticipated; and the only object and legitimate end of any treatment is to save the patient's life, until a proper or favourable period may be selected for operation.

The Nature of Diseased Actions causing Amputation.

A comparison of the causes producing

death during treatment, and the supervening diseased actions necessitating amputation in order to save life, show the difference to consist chiefly in the large predominance of fever, of distinct types, among the causes of death. In thirty-eight, nearly one-half died with fever of defined type. In the amputations, although febrile action in many was present, no fever of a very defined character was fairly established, except hectic, in some of the secondary operations.

Again, some causes produce death which do not appear among the causes leading to amputation; such, for instance, as shock, complicating wounds, secondary inflammations, purulent depôts, &c.

Some actions there are which necessitate or lead to amputation, but are never causes of death; as, for instance, contracted and useless limbs, paralysis from local injury, pain and nervous irritation from lodgment of a foreign body, &c.

If we compare causes of amputation in joint injuries, and in cases of compound fracture, without such complication, the cases of secondary hæmorrhage and tetanus necessitating amputation occur exclusively in *fractures* and not in *joint cases*.

In the causes of death between these two classes of injury, we have seen that there are distinctions equally obvious; in fractures not involving joints only one-third of the deaths were from "irregular" and accidental complications, and two-thirds febrile: in joint injuries, on the contrary, more than one-half the deaths were caused by the class of "irregular" actions, the rest febrile.

In reference to periods of amputation, whether in the intermediate or secondary period, certain differences may be observed. Tetanus in the series before us was never developed in the secondary period, although thrice in the intermediary. Gangrene preponderates in the secondary period. Those causes of specific character which may be classed among the irregular or accidental, are presented as causes of amputation in the secondary more frequently than in the intermediary period; in the latter they amount to one-third, in the former to more than one-half. We shall shortly see that a still stronger difference exists between the causes of *death* in the amputations performed at these two periods.

It only remains to be shown how these diseased actions, supervening on fractures, treated and leading to amputation or to death, vary according to the favourable or unfavourable nature of the injuries for treatment, and of the external circumstances.

In favourable cases the majority of amputations are performed in consequence of the supervention of certain well-defined and specific causes, such as may with propriety be classed among the irregular and accidental causes: secondary hæmorrhage, sloughing, contraction of limb, periosteal disease, &c.

In doubtful cases a large proportion of the amputations have a similar cause; not far from one-half, however, are amputated for general and local deterioration, marked by no very distinctive characters, but clearly indicating the hopelessness of further efforts to save the limb, and this is the chief difference observable.

In unfavourable cases seven-eighths are amputated from the hopelessness of conferring benefit by treatment, and not from any specific or peculiar action, sloughing and secondary hæmorrhage appear alone as specific causes.

From these facts I pointed out, as a legitimate inference, that when *favourable* cases are selected for treatment, only such of them will require amputation as may become the subject of some accidental complicating diseased actions; but in *doubtful* cases nearly one-half may be expected to require operation, as the natural result of the inflammatory and suppurative processes usually set up. When *unfavourable* cases, by adverse circumstances, or error of judgment, are submitted to treatment, seven-eighths of the whole, if so many afforded opportunity, would require amputation from the evident hopelessness of cure, and the consequent and natural progress of all the actions, local and general, from bad to worse, and all with rare exceptions not amputated, die. There are fewer specific causes of amputation in this class than in any other. In a series of 23, only three cases occur—secondary hæmorrhage and sloughing being the diseased actions.

Comparing these causes of amputation with the causes of death in each of these classes, we find that in the *series of fractures* (exclusive of joint injuries) 55 favourable cases only gave rise to two deaths: one with bilio-remittent fever and secondary abscesses of lungs and liver; the second with febrile action, type not ascertained.

One patient died in 21 doubtful cases during treatment, from effusion in the chest and vomicæ in the lungs.

Thirteen unfavourable cases were treated to the end, and all died—5 by hectic, with attendant bad actions; 1 bilio-remittent; 2 type uncertain; 1 secondary hæmorrhage and ensuing gangrene; 2 by shock; 1 complicating wounds and purulent depôt; 1 cause unknown at the end of three years.

As to the influence of external circumstances upon the diseased actions causing amputations, as in reference to deaths, we find the elements are the same in all—some difference existing in the proportion of one kind of diseased action to another. Mortification and sloughing—low action or excessive local disease predominate in cases treated under unfavourable circumstances, and indicate the kind of influence chiefly exercised on the nature of the supervening actions. The comparative frequency of the necessity for amputation, and the proportionate mor-

tality in cases not amputated, constitute the most important of the effects.

When the causes of death were compared with the causes of amputation, *both in reference to the site of injury*, as regards the upper and lower extremity, we found that more than one-third of the amputations of the lower extremity are performed to anticipate the full development of actions, the fatal consequences of which could not be doubted. In one instance only was this done in the forearm and hand, indicating that much more may be adventured in injuries of the latter during the first periods. Secondary hæmorrhage, however, preponderates in the forearm, wrist, and hand, as three to one. Sloughing and gangrenous action appear in both, but mortification of the extremity of the member in the lower extremity only. A sloughing action was developed in three of the upper extremity. Specific causes preponderate in fracture not involving joints, more than in injuries of joints, both in the upper and lower extremity. If we turn to the *causes of death*, considered in reference to the *site*, although we have only seven of the upper extremity, yet these present examples of many of the principal forms of disease which carry off those whose injuries are in the lower, viz., *shock, hectic, and exhaustion, with complicated wounds and sloughs, bilio-remittent fever, and purulent depôts*. These few cases, however, do not give, as do the lower extremity, any cases of trismus, secondary hæmorrhage, delirium tremens, and gangrene of limb.

Larger numbers, especially of the upper extremity, are required, before we can safely determine that cases of the upper are really more exempt from these grave diseased actions than are those of the lower extremity.

We have thus determined, first, the predominating actions developed by chronic and local disease of limb; and secondly, by those supervening on the injuries of civil and military life, through almost every phase of condition and circumstance. These actions constitute the effects of such injuries, and lead when grave to one of two disastrous results—amputation or death, in proportions which we have again seen alternate with each other, according to the nature of the injury and the external circumstances under which the cases are treated.

With these conclusions, determining the effects of those local diseases and injuries of the extremities, which form the classes requiring amputation, we are prepared to understand and appreciate the effects of the operation singly, and when superadded to these states; and, finally, to determine by comparison, the advantages and disadvantages of amputation when adopted in such cases. This forms the proper subject of the SECOND PART of the summary, the details of which are comprised in the last nine lectures of the series.

COURSE OF LECTURES

ON THE

ANATOMY, PHYSIOLOGY, AND DISEASES OF THE EAR.

By GEO. PILCHER, *Esq., Lecturer on Surgery.*

DELIVERED AT THE

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LECTURE IX.

Organ of Hearing in Mammalia.

IN this class of animals the auditory organ in internal construction will be found to assimilate closely to that of man. Viewing the external appendages, however, there are no orders of animals in which greater variety of figure and size is presented to the observer of nature, than in the accessory parts of the ears of quadrupeds. Nor can the observation be here withheld, that however endless the diversities of conformation which the organ may offer, there are no instances which do not abound in practical correspondence and relation between the means employed and the ends to be attained. To survey in detail the whole range of this great class, were to involve ourselves in a lengthy disquisition upon the habits and organisation of animals, with reference to the faculty of hearing; which more appropriately belongs to the subject of comparative physiology.

The external ear, of which the *auricle* forms the most interesting division, occurs under an extensive range of modifications; for in some orders the auricle will be found altogether absent or present in a very rudimentary and imperfect form; and in others it will be seen to have acquired a very large size. It will be sufficient for our purpose to notice cursorily only the leading distinctions of the several genera comprehended under this class. Instances of the imperfect development of the auricle are abundantly found in the aquatic carnivora. The cetaceous families, including the whales, seal, walrus, mole rat, and zemni rat, possess only obscurely-formed auricles; illustrations of the opposite extreme are afforded in profusion. The inordinate proportions which the external ear attains in the rodentia, canidæ, and ruminants, form a prominent contrast with the condition of this part in the former group. The dog and rabbit tribes are examples of the influence of domestication upon the size and character of the external ear. But it is somewhat remarkable that writers upon the changes of growth and other modifying agencies of

domestication upon the organisation of animals, have never remarked upon the contrary fact that the auricle of the cat, however much it may be disciplined into the ways of domestic life, never has its ears either reduced or augmented in dimensions. Of the dog tribe it is not required to look to the domesticated species to recognise instances of expanded size. The fennec, which belongs to this family, shows the extent to which the auricle may grow independently of domesticity. The general fact appears to be, with reference to domestication, that whenever it compels the animal to depart from its mode of living, such as food and exercise, it has the effect of inducing a laxity of structure in the whole body, which is rendered manifest only in the external appendage of the ear. Among the rodent mammalia the jerboa possesses the auricle in the largest form; and of the ruminants, in which the auricle is known as the *corset*, all are more or less distinguished by its enlarged size and prominence.

The *direction* which is given in different orders of animals to the external ear, has been dwelt upon by natural theologians as wonderfully proving design in the animal creation, and has been used by naturalists as a feature to be noticed in the classification of animals. In this respect the carnivorous and herbivorous families are strikingly distinguished from each other. In the former the auricle has a forward direction, and is ready therefore to assist and qualify the animal for a predaceous life. In the latter it is directed backwards, and is associated with a constant timidity of character; it is an important safeguard to its defenceless owner, for it is enabled thus to measure the speed of its pursuer. Dr. Grant has rendered the question which respects the relation between the direction of the auricle and the habits of the animal more intelligible because more definite as one of physiology.

He remarks that in all carnivorous animals the coincidence is sufficiently evident between the forward direction of the concha and the expanded development of the anterior hemispheres. In the herbivora the opposite condition of a small cerebrum and backward direction of the auricle is equally remarkable; it is difficult to place these facts in the order of sequence, but they are not destitute of physiological interest when regarded as coincidences. Like many other persons, M. Geoffroy St. Hiliare* has observed that all animals whose instincts impel them to burrow and dive, as the sorex fodiens, or water-shrew, and the hippopotamus, which seeks its food at the bottom of rivers, are provided with a valve, composed of a duplicated membrane, which serves purposes in the function of hearing required by the general habits of the animal. The crocodile, it will be remembered, has a similar provision.

In the hippopotamus and sorex, in which the ear possesses a well-defined membrana tympani, such a contrivance has for its principal object to protect the meatus against the injurious entrance of water and foreign matter. Before dismissing the subject of the external ear, it may be desirable to notice some of the varieties it presents a little more in detail. In the diving mammalia, which comprehend the otariæ and beavers, the external appendage is compact and small—a circumstance which conforms advantageously with their amphibious mode of living.

Disregarding all zoological affinities, many of the insectivorous rodentia, as the mole and the manis, in common with many others which are destined to live in subterranean habitations, in relation to the character of the external ear, may be classed under the section of intermediate sizes. Many of the anomalous forms of animals indigenous to the Australian continent, as the ornithorynchus paradoxus, and some of the marsupialia inhabiting the southern parts of Australasia, possess an external ear extremely deficient in size.

In the aquatic mammalia, as already noticed, the exterior appendage to the ear is wholly unformed, being represented only by a rudimentary meatus. The cetaceous order, comprehending the subgeneric tribes of the cachalots, narwhals, porpoises, and the dolphins; and likewise the herbivorous section of the same family, including the manatæ, rytina, and dugong tribes, present us with illustrations of this negative condition of the organ of hearing: so that in proceeding on an inductive survey of the permanent inhabitants of the water, from the myxinoid fishes which constitute the initial group, to the cetacea which form the terminal one, in the aquatic vertebrate series, the generalised fact may be established, that all are destitute of an external ear.

In the majority of mammiferous animals the concha consists of a movable cartilaginous appendage adjusted to the *processus auditorius*, and moved by a complexly-arranged system of muscles. In the horse these muscles are well developed, but, notwithstanding, are difficult of dissection, in consequence of the intricacy with which they are disposed around the auricle. The framework, or basis of the pinna, in most animals, is fibro-cartilaginous, invested with a cutaneous layer, which is distinguished by the delicacy of its structure, and moulded into the numerous sinuosities of the concha. The general statement may be made in reference to all the tribes of mammalia which live more *exclusively* upon land, that the exterior cartilaginous concha attains a standard of great development and symmetry; and in consequence of the superior organisation of its muscles and cartilages, added to

* Memoires du Museum, vol. i., p. 305.

their advantageous arrangement, the auricle is capable of easy, varied, and extensive movements. In relation to this order of mammalia, a few of the peculiarities may be observed in the ear of the cetaceous family, which will lead on to the next division of the external ear.

To John Hunter* is due the credit of having first produced an accurate and philosophical account of the whale's ear. There is here no auricle, even the most imperfect. The *meatus externus* terminates, or more properly opens, at the side of the head, in an extremely minute aperture, situated at a short distance posterior to the eye. Although no approach appears to have been made towards the formation of an external auricle, it is conjectured by Mr. Owen that the orifice of the meatus must be provided with a sphincter muscle for the opening and shutting the passage. The greatest singularity in the auditory meatus consists in its length and tortuosity, to which must be added the narrowness of its diameter. "It passes in a serpentine course, at first horizontally, then downwards, and afterwards horizontally again, to the membrana tympani, where it terminates. In its whole length it is composed of different cartilages, which are irregular, and united together by cellular membrane, so as to admit of motion, and probably of shortening and lengthening."

From this remarkable formation of the meatus, it may be naturally conceived that its narrowness and length must considerably impede the process of hearing. The practical testimony, however, of those engaged in the whale fishery is wholly adverse to the idea of imperfection in the sense of hearing. It is a striking trait in the history of these colossal animals, that they distinguish sounds with considerable acuteness from a great distance; the catchers, therefore, are obliged to exercise some ingenuity in the contrivance of means to insure a quiet and silent approach: nor is this difficult to understand. The simplest acoustic principles teach that sound is conducted with greater velocity and force by water than air. To obviate, therefore, the jarring and concussion which would be produced upon the auditory nerve by the sonorous impulses conveyed to it through an aquatic medium, no contrivance could be more effectual than that which it possesses. A fact, however, will be afterwards noticed, which materially modifies the idea generally held in regard to the functions of the external meatus, and which first occurred to myself when formerly investigating the organ of hearing in the cetacea; it relates to the connection which the Eustachian tube is found to have with the blowing-hole, thus assuming vicariously the functions of the external meatus, and will be subsequently described.

The Tympanum.—In the description of the tympanic cavity, we commence with the most external part, thence proceed towards the interior. The part which the dissector first encounters is the membrana tympani, composed of a dense, compound structure, and supposed by some anatomists to assume a muscular character in the larger animals. This opinion was originally given by Sir Everard Home, the materials for which were probably derived from the more laborious dissections of John Hunter. The instances adduced by Sir Everard to demonstrate its muscularity, have, however, dissatisfied all subsequent anatomists; nor has the idea of its muscular nature received any advocacy from microscopic authorities. The presence, however, of radiating fibres is susceptible of clear demonstration; they may be seen to converge from its circumference towards a linear elevation in the centre of the membrane, which corresponds with the attachment of the manubrium mallei. It is determined that they do not participate in muscular character, but consist rather of fibrous filaments, arranged on one plane, and forming the proper membrana tympani. In mammalia, for the most part, the convexity of the membrane presents towards the tympanic cavity. In this circumstance it will not be forgotten that it differs from the character of the drum-membrane, as existing in reptiles and birds, the convexity in which being towards the meatus. In the cetaceous mammifera the membrane is also convex externally, so that it constitutes a prominent distinguishing character of the class, associating the whole with the bird and the reptile. There are, however, points of mechanism which remotely separate these families of animals from the cetacea. At first view the membrane is, externally, equably convex, in consequence of a ligament which proceeds from its surface inwards for attachment to a process upon the malleus. In the figure given by Sir E. Home, in the Philosophical Transactions,* the upper half of the convexity is shadowed so strongly as to appear as a distinct structure from that over which the ligamentum tympani is expanded; and this view must have embodied his notion of the relations of these parts when he denied the accuracy of Hunter's dissections, and maintained that there was no connection between the membrana tympani and the malleal bones. M. F. Cuvier, however, has satisfactorily proved the looseness of Sir Everard's supposed improvement upon Hunter's description. Cuvier speaks of this ligament as a thick, opake aponeurosis, and not as represented by the figure given by Sir E. Home (a semi-

* Philosophical Transactions, 1787, p. 441.

* 1812, p. 88.

transparent membrane), the outer extremity of which is carried over the upper portion of the membrane, and terminates by attachment to the malleus. It is by its agency that the undulations of the membrane are made to affect, without loss of intensity, the chain of ossicula which are freely suspended in the drum-cavity.

In mammalia, as in *man*, the innermost of the three layers into which the membrana tympani is divisible, consists only of the common lining of the cavity, prolonged smoothly over its *convex* surface, and continued thence to invest the auditory ossicles. The outermost lamina is likewise a prolongation of the common cuticle, undergoing only a slight modification from that which lines the meatus; the latter being furnished with numerous follicles, peculiar to the ear, and named the *ceruminous*. That upon the membrane of the tympanum is more attenuated, and marked by the absence of these follicles. In analysing, therefore, the structure of the membrane from without inwards, the layers may be successively designated the *dermoid*, *fibrous*, and *mucous*.

The *cavity of the tympanum* in the class of animals now under review, is well defined in character, and constitutes the *third* division of the auditory apparatus in the order of development in the animal series. It is intermediately placed between the labyrinth and external meatus, communicating by means of the Eustachian tube with the pharynx. To this disposition of the tube there are some exceptions. The tympanum in all the mammalia may be described as a diverticulum of mucous membrane from the gastro-pulmonic tract, and inclosed in an irregular excavation in the petrous element of the temporal bone, bounded by bony and membranous parietes, except those situations in which apertures of communication with the pharynx and mastoidal cells occur. The osseous labyrinth, with the membranes of the oval and round fenestræ, then forms the internal boundary of the cavity; the vibratile membrane of the tympanum, the external; the Eustachian tube and surrounding bone, the anterior; and the bony wall on which are seen the pyramid and mastoidal apertures, form the posterior and superior walls. This definition holds equally correct in its application to the tympanum of the human subject. As the anatomical characters of this cavity, taken generally, present nothing of especial difference from those which belong to the tympanum of man, it is necessary only to state that the vestibular and cochlear fenestræ are nearly similarly situated, and consequently perform similar functions. That portion of bone by which they are separated corresponds to the commencement of the tympanic scala of the cochlea, and is called the *promontory*. Small sulci are distinguishable upon the summit of the promontory, in which are lodged the minute nerves which form the tympanic plexus.

The *eminentia pyramidalis* is situated on the posterior wall, and affords attachment in its interior to the stapedius muscle. At the roof of the cavity a projection is caused by the Fallopian aqueduct, of which a more detailed description will be given in the succeeding lecture.*

The *ossicula auditûs* in the mammiferous animals, without a solitary exception, are multiplied into the normal sum of three, and even into four, if the little sesamoid bone, the orbicular, be calculated; they present analogous relations to those of the human subject, and are acted on by similar muscles. On the upper part near the membrana tympani, an excavation may be observed in the osseous wall of the tympanum, into which the head of the malleus is received. Notwithstanding the statement that these ossicles in mammalia present a positive advance towards that condition which exists in man, there are many interesting gradations discoverable when the examination is extended throughout the *series*. The columella of birds and reptiles has been shown to consist of a continuous piece of bone. The advancing complication of the laws of organisation and cautious march of organic evolution, is no where more beautifully seen than in the

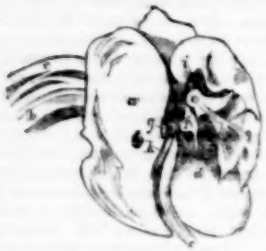
* [In the canidæ, rodentia, and more markedly in the carnivorous species, as well as many other of the mammiferous families, a remarkable *hollow* appendage is superadded to the true tympanum, replacing in office the ordinary mastoidal cells. In some orders this constitutes an obvious projection at the side of the head; in cats and tigers it is prominently developed; while in the bear as a tuberosity it is scarcely appreciable. It may not be uninteresting to invite the attention of the phrenologist to this source of fallacy in the usual method of cranioscopical examination. Animals in which this excavated recess of the tympanum was capacious, with necessarily a corresponding prominence externally, would be immediately pronounced to possess the *organ of destructiveness* in a condition of formidable development; † while, in reality, the interior of this reputed fountain of destruction was charged with no other weapon than "harmless air!" This is an apposite instance of the *solid* foundation on which the fabric of phrenological science is erected. As suggested by Mr. Owen, the office of this large cell of the tympanum is to impart additional volume to the sounds within this reverberating chamber; a circumstance especially required by the nocturnal habits of those animals in which it occurs.—T. Williams.]

† The author of this note is evidently not familiar with Vimont's magnificent work; and as little with the labours of Gall and Spurzheim.—Ed. L.

development of this minute element of the acoustic economy. Sir A. Carlisle correctly remarks, that in the ornithorynchus and the kangaroo, so bird-like is the stapes in figure and formation, that it might be mistaken for the ossicle of one of the feathered tribe; and every intermediate shape is met with as we advance from this point towards the stirrup-shaped bone of the most perfect quadruped.

Fig. 16.

Organ of Hearing in the Porpoise.



(a) Portion containing the vestibule.
(b) Acoustic nerve.
(c) Facial nerve.
(d) Cavity of the tympanum.
(e) Malleus.
(f) Incus.
(g) Stapes.
(h) Muscle and ligament connecting the membrana tympani to the malleus.
(i) Muscle of the malleus.
(k) Stapedius muscle.

The *Eustachian tube*, in the greater proportion of instances, is short, imperfectly assuming the tubular form. In the carnivorous order of mammals this character is well marked: Cuvier describes it as nothing more than a narrow cleft in cats and civets, and seen in that situation which corresponds to the line by which the tympanum is joined to the true petrous bone. The dissections of Hunter inform us, that the Eustachian tube in the whale "opens on the outside of the upper part of the fauces; in some higher in the nose than others—highest in the porpoise." While formerly engaged in the study of the auditory economy in the cetacea, it occurred to me, and the same idea was likewise conceived by a late intelligent friend and pupil, Mr. Swinburn, during the dissection of the ear of the porpoise, that in consequence of its free termination in the blowing apparatus protected by a valve, the Eustachian tube might perform the part of an external meatus in the work of audition. Nor upon reflection is it difficult to understand that the sonorous waves may be conducted along the Eustachian tube into the cavity of the tympanum and the large, hollow bone, which is peculiar to these animals, thus determining the vibrations of the *ossicula*, eventually to produce the sensation of hearing.

This opinion is carried out by the anatomical arrangement of the ossicula and drum-membrane.

As already shown, the malleal extremity of the osseous chain is not fixed on the ordinary plan to the membrana tympani, but is supported in the most favourable oscillating position by means of the ligamentum membranæ tympani. Uniting further to this consideration, the great diameter of the Eustachian tube, the internal concavity of the membrane (with which an *unbending* columella is associated in all other animals in which this form of membrane exists), and the tortuous length and reduced calibre of the external meatus, the general inference evidently indicates that the vibrations of the ossicula are determined rather by the sonorous pulses conducted to the tympanic cavity along the wide channel of the Eustachian tube, than by the external meatus now performing the functions of an Eustachian tube.* These probabilities are much strengthened by the practice of the animal of reposing so near to the water's surface, that the Eustachian tube has a direct communication with the atmosphere at the same time that the *external meatus* is submerged; a situation in which the creature has the greatest necessity for acute hearing, and one which it is obliged frequently to seek for the purposes of respiration. This view receives partial authority from the circumstance, that with some modifications the same idea occurred to Sir E. Home. It appears under a more elongated form in the dog than in the feline tribe.

The *semicircular canals* in the *inferior* vertebrata afford a correct conception of their condition in the *higher*, exhibiting the same

* [But this explanation of the mechanism of hearing in the cetacea, does not convey an explicit notion of the office performed by the external auditory passage in the process, and therefore leaves unsettled its purpose in the economy of the ear. It is not probable that an animal, destined to a perpetual residence in the ocean, should be destitute of means by which to appreciate sounds produced in, and conveyed to its ear by the water; nor is it easy to perceive how the Eustachian tube can afford provision for such a deficiency. From the peculiar disposition and form of the external meatus, taken in connection with the fact that the animal seldom rises so high as to place its orifice above the water's surface, the conclusion is necessary that it forms the avenue through which the vibrations of the denser element are enabled to affect the organ of hearing. The uses of the two channels, the Eustachian tube and meatus externus, may be contrastively expressed by the terms *acrophonic* and *hydrophonic* words, compounded of "sound," and the elements respectively by which it is propagated to the percipient apparatus.—T. Williams.]

arrangement, and communicating in like manner with the vestibule by five orifices. The membranous labyrinth may be readily seen in the mammalia; the general outline of which corresponding with, and appearing as the counterpart of osseous labyrinth: according to the dissections of many comparative anatomists, a cretaceous powder is present in the labyrinth of all mammiferous animals. The *membranous canals* and their ampullæ are comparatively slender; their median portion forms the larger part of the broad, short, and irregular vestibule, and its lapillus corresponds with the utricle of fishes.

It is an opinion advocated by Wheatstone, Autenrieth, and Kerner, that the degree of capability of judging of the direction of sound is directly as the size of the semicircular canals. Dr. Young ascribed to them the power of assisting in the estimation of the pitch or acuteness of sound. The merits of these views will be subsequently considered. Although numerical variation in the canals is seldom seen unless from abnormal causes in the higher vertebrate series, that of diameter or size is frequent. In considering the size of the semicircular canals in connection with the degree of faculty which different animals possess of estimating the direction of sound, more especially with reference to the *width* than the length of the canals, Dr. Todd remarks, that "the lower animals, the first in order as regards this power is the hedgehog, which, after the human subject, has, relatively to its size, the widest canals: we may form some idea of the width of these canals, from the fact that in their centre they are nearly as wide as the semicircular canals of the pig, which is so very much larger an animal. Next to the hedgehog stands the mole, whose canals

Fig. 17.

The Semicircular Canals and Cochlea.

are proportionately to the size of the animal, both remarkably wide and long; they are peculiar also as projecting free (visible without any preparation) into the cavity of the cranium. The mouse comes next, then the fox and the dog, in different races of which, Autenrieth and Kerner found the width to vary; and afterwards the rabbit, the cat, the pig, the cow, the horse, and, lastly, the sheep.

The *cochlea* has now attained its standard of highest development, and consists of a spiral addendum to the vestibule. It is not easy to convey a correct idea of its anatomical character by any verbal description.

Commencing at the *ostium vestibuli*, a tubular channel may be traced twice and a half round a central pillar, called the modiolus; and followed upwards to its summit, where it terminates under the dome or cupola. This channel, which is technically known as the *canalis spiralis modioli*, is subdivided by a *lamina*, consisting partly of bone and partly of membrane; so that in tracking upwards the vestibular scala, it is found to communicate with the beginning of tympanic scala. The size relatively to the body of the animal, which this element of the ear presents in the several sub-orders of mammalia, is subject to important variations. And in reference to the spiral canal, Hunter remarks, that in the whale, in addition to the two gyri, there is a third, which makes a ridge within that continued from the foramen rotundum, and follows the turns of the canal; and in comparison with the semicircular canals, is very large. The chiropterous mammalia offer two general forms. The cochlea of the insectivorous bats presents an appendage of very considerable dimensions, when measured by the size of the semicircular canals. In the account given by Professor Owen, the circumference of the cochlea in the horseshoe bats (rhinolophus) is stated to be no less than four times the circumference of the canals. In the pteropus this proportion is very much less. The carnivorous group of bats possess a cochlea less considerably developed: the cochlea in the rodentia is peculiar for its narrow, lengthened and spiral form. The rabbit furnishes an instance, in which it is very prominent.

There is a further peculiarity in the formation of the cochlea in the rodent quadrupeds, examples of which are found in the Guinea-pig, the cavy, and the porcupine, and which consists in the fact that its spirals exceed the ordinary number by one and a half. The tympanic and vestibular scalæ are in this perfectly formed, and differ in no respect from that of the human *subject*.

On the Ear of Bats.

[Since the *cheiroptera*, or bat-tribe, are grouped with the mammalia, from the numerous points of affinity in organisation

which they present to the mammiferous type, in the description of the organ of hearing, they should likewise have a position assigned them under this class: in them the sense of hearing is highly endowed. The whole organ is constructed upon a scale relatively to the size of the body, larger than that which prevails among the other orders of mammalia; and this enlarged form of the ear is rendered more striking when viewed in juxta-contrast with the eye: the diminutive proportions of which the ear appears designed to compensate. The external appendage in some species, as in the pteropus, however, does not exceed the ordinary dimensions, and presents the usual inequalities which distinguish the pinna of all mammiferous animals. In the insectivorous genera, the concha, on the contrary, attains a very considerable size; while the ear of the plecotus auritus, the common bat of this country, supplies a well-marked example of the average magnitude which the auricle acquires in these nocturnal animals. In addition to the feature of size, there is a further remarkable peculiarity in the auricle of some of the cheiroptera. The *tragus* is more highly evolved than is ordinarily remarked in the mammalia, and presents at its summit, according to the description of Owen, a bifurcation, which enables it to fit more accurately over the orifice of the meatus. This condition may be seen in the vespertilio spasma; and in those species which are called the great bats of Britain, vespertiliones noctulæ, although less forked than in the former. It cannot be doubted that this augmented proportion is given to the tragus of the bat's ear, as a provision for the guarding of the meatus against injury during the flight of the animal through the intricacy of the wood; and probably, also, from the too rapid introduction of cold air during the abrupt vicissitudes of atmospheric currents, in order that the air, on either side of the membrana tympani, may be maintained at an uniform temperature. The only remaining peculiarity in the auditory organ of the bat consists in the inordinate size of the cochlea. It appears to me that the hypothesis of Weber, Breschet, and others, which assigns to the cochlea the faculty of appreciating sonorous undulations as conveyed by the surrounding *solid* parts, derives from this fact an interesting confirmation.—T. WILLIAMS.]

THE ORGAN OF THE MIND.—Mental acts have been instantaneously arrested by the pressure of the finger on the brain; and during mental repose and activity such changes have been seen in the workings of this mysterious organ, as have induced the greatest of British surgeons to declare that tranquillity of mind is an indispensable condition for the cure of injuries of the brain.—*Dr. Cowan.*

KING'S COLLEGE HOSPITAL.

CLINICAL OBSERVATIONS ON CASES OF DISEASED HEART.

BY DR. R. B. TODD.

THERE having been four interesting cases of diseased heart at the same time under Dr. Todd's care in the hospital, he took a review of the symptoms of each case, for the purpose of contrasting the effects, very different both in kind and in degree, which result from different lesions of the heart.

Dr. Todd expressed his belief that the proximate causes of the heart's sounds were, for all practical purposes, sufficiently distinctively made out by recent experiments, many of which he had himself performed in conjunction with Drs. Williams and Clendinning.

The elements of the first, or systolic, sound, he considered to be threefold. 1. Tension of the auriculo-ventricular valves. 2. Muscular bruit. 3. Impulse against the thoracic parietes. These elements were enumerated in the order of their importance. The first had been much insisted upon, and with great justice, by Dr. Billing. Its importance might be best appreciated in cases of disease, where even a slight lesion of those valves, the mitral in particular, whether affecting their elasticity, or impairing their sufficiency, would modify the systolic sound, in a manner readily recognisable by a practised ear.

The second sound, inaccurately called diastolic, was occasioned by the sudden tension of the semilunar valves, consequent upon the falling back of the column of blood in the arteries upon them. It was evident that this sound could not be perfect, unless these valves possessed their natural pliability and elasticity.

Dr. Todd believed that the strength and clearness of this sound were also dependent, in a great degree, upon the state of the vital tone of the arterial parietes. In an atonic state of the arterial tunic the column of blood would be thrown back upon the valves with feebleness, and thus these membranes would be stretched but slightly. In this way might be explained the feebleness or even absence of the second sound, which had been noticed in typhus and other depressing diseases.

When, on the other hand, the arterial tunic was in a highly tonic state, it reacted powerfully on the column of blood, which was quickly and forcibly regurgitated, and being intercepted by the semilunar valves, caused correspondently rapid and forcible tension of them, and a proportionately clear and distinct sound. Thus it might be stated, that two conditions were necessary to produce a clear and perfect second

sound. First, perfectly healthy and pliable semilunar valves, with, of course, a normal state of the arterial ostia; and, secondly, a tonic state of the arterial tunic.

It was likewise to be borne in mind, that during the production of the first sound the ventricles were in systole, and that indeed the systolic act and its consequences or accompaniments, namely, valvular tension and impulse, were the causes of the first sound; and that simultaneously with the production of the second sound, the ventricles were in diastole, but the passage from the systolic to the diastolic condition was in no way the cause of that sound.

These were points which required to be always kept in view in forming a diagnosis of heart-disease. When a bellows-sound was heard, it was important to determine where it was produced; it might occur in one of three places—first, in either auriculo-ventricular orifice; second, in either arterial orifice; third, in either artery itself, beyond the valves.

When a bellows-sound occurred in the auriculo-ventricular orifice, it was generally, if not always, the result of regurgitation from the ventricle into the auricle during systole; it then accompanied the first sound, and was best heard at the apex of the heart; and sometimes it was very distinctly heard behind, to the left of the vertebral column, at the angle of the scapula, as occurred in two of the cases he was about to detail. When there was disease in the aortic orifice, so as to obstruct the passage of the blood from the ventricle, a bellows-sound would also accompany the heart's systole; but in this case the sound would be best heard over or near to the cartilages of the third rib, and in the course of the artery. The same occurred when the disease was situated not in the aortic valves, but in the aorta itself beyond the valves.

When the disease of the aortic valves was such as to render them insufficient to prevent regurgitation into the ventricle, a bellows-sound would replace the second sound; and if, as was sometimes the case, an obstructive disease of the valves were co-existent with this insufficient condition, the bellows-sound would also accompany the heart's systole; and in such a case there would be a double bellows-sound, to and fro, diastolic and systolic.

It was also necessary to an exact diagnosis, to determine what space the heart occupied in the chest,—for this purpose percussion afforded valuable information; and we should also carefully examine the point at which the heart's apex might be felt pulsating.

The careful physician would not content himself simply with an examination of the physical signs; all important as these were to diagnosis, he knew full well that much more assistance might be derived from symptoms, in enabling him to form an accurate prognosis, and to adopt a judicious line of treatment.

The pulse, the state of the respiration, the condition of the capillary and venous systems, the existence of pain, of dropsy, the condition of the abdominal viscera, especially the liver, demanded the most careful investigation.

Case 1.—The first case to which he directed the attention of the students was that of Ellen Grace, aged 29, who was admitted on the 4th of February into St. Clement's ward. She was a married woman, and six months advanced in pregnancy at the time of her admission. She had rheumatic fever three years ago. Her present illness began, as she stated, with swelling of the abdomen and legs four months before. Two months ago she began to be troubled with cough, accompanied by slight expectoration, palpitation of the heart, and dyspnœa. She was first attacked with dyspnœa suddenly, while in bed, at night, and received temporary relief from venesection; since then the dyspnœa had occurred several times. Her present symptoms are orthopnœa, on account of which she is constantly propped up in bed; countenance anxious, leaden, and slightly œdematous; considerable anasarca of the lower extremities; some ascites, which contributes with her pregnancy to the swollen state of the abdomen; troublesome cough, with slight mucous expectoration, which greatly disturbs her at night. The pulse is feeble, small, and as if a small stream of blood were propelled into the artery, it ranges from 90 to 100; appetite bad; thirst; tongue moist; liver slightly enlarged; the heart's impulse is strong, and the apex is felt between the fifth and sixth ribs.

The first sound is obscured by a loud bellows-murmur, most distinct a little above the apex, and likewise very distinctly heard at a corresponding point in the back. This sound gradually diminishes in proceeding upwards from the apex of the heart to the clavicle, and is not at all heard over the aorta or its branches. The second sound is natural and distinct. Percussion over the region of the heart yields a dull sound over a larger surface than is natural: lungs congested.

Case 2.—Dr. Todd begged the students to compare the above case with the following. Mary Fitzgerald, aged 17, was admitted on the 16th of January. This girl's first symptoms were cough without expectoration, which came on two months before admission: then came dyspnœa and palpitation, both being much increased by exertion of any kind. She lost her appetite, emaciated, and became feeble. The dyspnœa and palpitation increased up to the time of her admission, and she then complained of a

troublesome dry cough; her breathing was laboured and quick, but she could lie down; respirations 36 in number; very slight œdema of the feet and ankles; appetite bad; some thirst; countenance very pallid. She had a very exsanguineous appearance, and had been very much exposed to cold, wet, and other privations; her pulse was small and feeble, and ranged from 100 to 110.

The respiratory sounds were natural, except in the inferior lobe of the left lung, where a large crepitation indicated an œdematous condition of the pulmonary tissue.

The heart was tumultuous in its action; the first sound was accompanied and obscured by a bellows-murmur, which was most distinct at the apex, and was also heard, but less distinctly, in the left back. The second sound was normal, nor could any abnormal sound be heard over the arteries.

These two cases, Dr. Todd observed, had many points of similarity, and yet they exhibited some important differences. Whilst the diagnosis in both of them would be very much the same, the prognosis and treatment would differ materially.

In both cases the physical signs clearly pointed to the mitral orifice as the seat of disease. The second sound was natural, and nothing abnormal was heard in the course of the arteries; therefore it was inferred that the arterial valves were good, and performed their office effectively; but the systolic sound was in both cases obscured by a bellows-murmur, which was best heard at the apex of the heart, or a little above it, which diminished and disappeared towards the clavicle and over the arteries, and which was also heard distinctly at the left back. Now, a systolic bellows-sound could only occur at two places—the first being at the orifice, or in the course of the artery; the second in the auriculo-ventricular opening.

In these cases it was not in the first-named situation, because it was not heard over, or in the course of the artery; nor did the state of the pulse correspond with that condition of arterial valve, or artery, which would give origin to such a bellows-sound. The cause of the sound must have been, then, at the mitral orifice, because the places at which it was best heard corresponded very nearly to that part of the heart.

It could not be at the tricuspid orifice, for, first, it was highly improbable that a bellows-sound produced at that orifice should be heard at the left back; on the contrary, the situation in which it would be best heard, would be over the sternum. Secondly, such disease of the tricuspid orifice as would cause bellows-sound, was of very rare occurrence; although regurgitative disease of that orifice was common: and, thirdly, an insufficiency of these valves would give rise to pulsation, or at least to turgescence, of the jugular veins, which symptom did not exist in either of the cases.

Our diagnosis, therefore, in both cases, must be disease of the mitral valves, causing a permanently patulous state of the orifice, and destroying the valvular office; so that at each systole a portion of blood regurgitated into the left auricle. It was probable that in Fitzgerald's case the orifice was less contracted and the valves less diseased than in Grace's, because the bellows-murmur was less distinct, and of a softer kind, and the symptoms were less urgent.

And now with respect to the prognosis and treatment: Grace had long suffered from dropsy, which denoted a considerable obstacle to, and languor of, the circulation; her dyspnœa was intense, her cough violent. The dropsy yielded but slightly to purgatives and diuretics, and the violent action of the heart was scarcely at all affected by digitalis. Sleep was constantly disturbed, and her mind wandered. A very short time more must put a period to her sufferings.* Fitzgerald had, however, the advantage of being much younger; her dyspnœa was less urgent, and her cough was considerably controlled by sedatives. She had a very irritable heart, which, however, could be subdued by rest and sedative medicine. She had little or no dropsy. This girl might be kept alive for a very considerable time, and with attention and proper nourishment might lead a comparatively comfortable life.†

In the first case the object of treatment was obviously to procure rest, alleviate the urgent dyspnœa and cough, and to remove or reduce the dropsy. Opium was found, for some time, fully to answer the first object, but they were compelled to give it up, as it affected the head. With regard to the other indications, they were less successful, although most of the sedative and diuretic drugs were put in requisition.

Fitzgerald benefitted by a generous diet and porter: sedatives and steel, opium, hydrocyanic acid, and digitalis, severally afforded her some relief.

Case 3.—This case had excited great interest during the lifetime of the patient. William Taylor, aged 46, a clerk, was admitted into Sutherland ward, on the 21st of January. He came to London from Scotland in December, and had suffered some privations from being out of employment. He made assurances that he had been always temperate, but he had not quite the

* A fortnight after the lecture was given this patient left the hospital, and died the day after. An autopsy could not be obtained.—*Rep.* L.

† This girl left the hospital very much improved in appearance.—*Rep.* L.

appearance of having been so. He was a large man, of sallow complexion, and rather fat. He had enjoyed good health till a few days before Christmas, when a cough came on, without any assignable cause. Soon after this he had dyspnœa, which was much increased by any exertion; but at this time he had no palpitation, or any other uneasy feeling referrible to the heart. A fortnight before his admission he first perceived his ankles begin to swell, and the swelling soon extended over the whole lower extremities, and in a few days to the abdomen.

On admission, his symptoms were dyspnœa, amounting almost to orthopnœa, mucous expectoration, anasarca of the lower extremities, ascites; the respirations were thirty in a minute; pulse 104. It was of a bounding character, and communicated to the finger the sensation as if, after the wave had passed, the walls of the artery collapsed, and it fell empty; it was, in short, what Dr. Hope had called "the pulse of unfilled arteries." This kind of pulse was very peculiar, and Dr. Todd recommended the students to make themselves well acquainted with it. It was very characteristic of that condition of the valves of the aorta which rendered them insufficient to check the returning column of blood, forced back by the elasticity and tonicity of the arterial walls, and to prevent its regurgitation into the ventricle.

On examining the chest, it was found to be resonant everywhere but in the region of the heart, where dulness was not preternaturally extensive. Much large crepitation was heard all over the chest, but especially posteriorly; the impulse of the heart against the ribs could not be felt. On listening between the cartilages of the fifth and seventh ribs the first sound of the heart was quite inaudible, but a faint *diastolic sawing* sound was heard, which became much more distinct above, along the course of the arch of the aorta, and was most distinct at the upper part of the sternum. It was distinctly audible in the carotid and subclavian arteries. When the stethoscope was placed over the ensiform cartilage, the first sound became audible; it was faint and distant, and unaccompanied by any abnormal murmur. This was the only point at which the first sound could be distinguished.

He must not forget to mention another remarkable sign which was very conspicuous in this patient; namely, a locomotion and visible pulsation in all the superficial arteries. This sign was very valuable as an indication of imperfection in the aortic valves.

It was not difficult in this case to determine that the principal cause of the poor man's sufferings was a lesion of the aortic valves, which impaired their action as valves, and allowed a certain portion of the blood expelled from the ventricle by its systole to regurgitate into it during its diastole. The returning stream creating a vibration in the orifice, either by acting on the margin of the diseased valves, or of the healthy ones (if one only were diseased) which gave rise to the sawing sound audible during diastole, and which took the place of the normal second sound.

The grounds upon which this diagnosis was formed were as follows:—First, the pulse; its jerking nature followed immediately by the collapse of the arterial wall, and the locomotion of the arteries already referred to; second, the sawing murmur taking the place of the second sound, and, therefore, indicating such a condition of the semilunar valves as was capable of affording an obstacle to the regurgitating current sufficient to produce sound; third, the extreme feebleness of the first, or systolic sound, indicated a condition which naturally and necessarily ensued upon regurgitative disease of the aortic orifice; namely, dilatation of the ventricle. This patient lived only a fortnight after his admission. The immediate cause of death was pulmonary congestion. The current regurgitated into the left ventricle, kept that cavity always in a gorged state; this again reacted upon the left or pulmonary auricle, and that upon the pulmonary veins and the whole pulmonary circulation. As a necessary consequence, the capillary system of the lungs became immensely congested, and had it not been for one or two small bleedings by venesection, and cupping him several times over the chest, the outburst of pulmonary hæmorrhage which carried him off must have taken place much earlier.

For some days previous to the 2nd of February his expectoration was discoloured, and resembled not a little that of pneumonia. A small cupping on the chest never failed to relieve his breathing, and diminish the colour of the expectoration for a time. On the evening of the 1st of February, he was seized with a very copious hemoptysis, which continued throughout the night till the next day. Although he was weak and low, the taking away of some blood by cupping was ventured on; this seemed to check the hæmorrhage, and relieve the dyspnœa for a time; the dyspnœa, however, returned some hours afterwards, and he died almost asphyxiated. Previously to death, the anasarca had considerably extended, and now affected not only the lower half of the body, but also the hands and arms, especially of the right side, and likewise, to a slight degree, his face.

The autopsy verified the diagnosis which had been made. The heart was enlarged; the aorta was somewhat dilated, and its coats thickened and indurated with atheromatous deposits. The semilunar valves were also thickened, and upon pouring water into the aorta above the valves, it was

found to run past them into the ventricle; one of the valves had been torn for about one-third of an inch of its extent from its attachment to the aorta, and thus formed a triangular flap, hanging loosely into the mouth of the artery, and which must have flapped to and fro according as the current of blood passed to or from the ventricle, thus giving rise to the regurgitation which destroyed the balance of the circulation. All the cavities of the heart, both right and left, were hypertrophied and dilated; the right cavities were filled with venous blood. The lungs were greatly congested; some apoplectic spots had formed on the upper lobes; the lungs were not very crepitant, and collapsed imperfectly; there was much mucus in the bronchi.

The abdomen contained a good deal of fluid. The liver was large and much congested.

Case 4.—He would briefly add one case more to contrast with that just related. Ann Eaton, aged 30, a servant, was admitted into St. Clement's ward on the 14th of January. This woman stated that she had had several attacks of what she calls inflammation in her chest, attended with palpitation of the heart. Her present symptoms set in a fortnight before her admission; they are dyspnœa, brought on by any exertion, palpitation, short cough without expectoration. She has a narrow, rounded, and prominent chest; the region of the heart is preternaturally dull; the heart's impulse is strong, and there is a loud systolic bellows-sound indistinct at the apex of the heart, but very distinct at the base and along the course of the arteries; the second sound is natural; the pulse is thrilling but strong. Rest and digitalis relieved this woman's symptoms, but did not remove the bellows-sound, nor the disposition to dyspnœa and palpitation which exertion always induced. He was led to examine this woman carefully for aneurism, from her having stated that she occasionally lost her voice, and also in consequence of the short cough and shooting pains in her chest, of which she frequently complained. There were no satisfactory signs, however, to indicate the existence of an aneurism. The symptoms seemed sufficiently to denote obstructive disease of the aorta. The second sound was natural, therefore the semilunar valves performed their office. The bellows-sound was heard along the course of the aorta and the vessels arising from it; it diminished in intensity from the situation of the aortic orifice to the apex of the heart. The seat of the sound was, therefore, at the aortic orifice or immediately beyond it, and it probably arose from some slight obstructive alteration of the valves, thickening, for instance, not sufficient to impair their action, although enough to cause sound.

This was one of the most common forms of cardiac disease which came under observation; it had its origin frequently in an attack of acute rheumatism. So long as the obstruction was not sufficient to react materially upon the heart, and derange the balance of the circulation through it, the patient experienced very little inconvenience; and the lecturer knew persons who had distinct systolic bellows-sounds connected with obstructive aortic disease, whose appearance was indicative of perfect health, and who did enjoy excellent health. He prognosticated favourably of such cases as that of Eaton which he had just described. Quiet, the avoidance of mental and bodily excitement, and sedative remedies, were very effectual in these cases in mitigating the symptoms and prolonging life. But when the aortic disease was such as in Taylor's case, of the regurgitative kind, the interference of art would, ere long, be rendered nugatory, by the total derangement of the mechanical protection which the heart experienced from its valves.

FORMIDABLE ANEURISMAL STATE OF THE LEG, CURED BY COMPRESSION.

By Samuel Young, Esq., Surgeon.

Dec. 18, 1829. Rebecca Thomas applied for a curious vascular affection of the left leg; from an aneurismal spot, a pendulous body issues at the outer part of the limb, three inches below the knee. The patient is full habited, and of a florid, sanguineous temperament; age, thirty years. First noticed the disease ten years since, in consequence of receiving a slight blow on the part; from the immediate pain produced was then first led to examine the part, and there found a dark, purplish crimson spot, about the size of the top of a woman's thimble. The spot at first was flat on the surface, and its covering like a very thin vellum, but soon rose up to the height of half an inch, hot and pulpy to the feel. On this occasion, after the pain, which continued for some ten minutes or more, went off, the tumour which had so risen returned to the level of the skin. For six years it remained without any apparent growth or pain, except at the latter part of this time, when it remained much longer above the surface than in the first-mentioned instance, after accidentally receiving even the slightest touch.

On the Thursday before Christmas-day (1836), whilst stooping to draw off a person's boot, she felt something very warm trickling down the leg, and on looking, perceived blood on the ground and her clothes drenched. The part was bandaged up with

flour, and the patient went to bed, when the bleeding ceased; next day she applied to a medical man, the part was swollen full two inches above the surface, and was more than an inch and a quarter in diameter at the top.

In the course of three or four days the tumour subsided; but from the bottom the present pendulous substance was produced, which is now fully the size of a large fig, and largely supplied with blood-vessels. At the time, however, of the subsiding of the tumour, this appendix was only the size of the first joint of a moderate forefinger; the very dark colour of the tumour then subsided.

The fig-like appendage grew rapidly the first twelve months to nearly its present size; even in a fortnight after the subsiding of the tumour, as here described, upon the appendage being roughly handled at a surgical examination, a physician and surgeon being present, the blood was thrown upwards with great force on and over the patient's shoulder, and continued bleeding largely from the lower edge till bound up with plaster straps and lint compress.

Next day, when the applications were removed by the medical attendants, on being again handled, the fig-like appendage not only swelled up, but the aneurismal skin also rose full three inches above the surface. The patient describes the feeling at the time as if the whole were forcibly being dragged out by a pair of pincers.

At the same moment, from the under and lower edge of the appendage (which the patient herself calls the *tongue*), an immense hæmorrhage commenced, filling a large washhand basin half full. The bleeding was of that character and to that amount, as to induce the physician who was present to exclaim, "By ——— the woman will bleed to death." The patient was rendered so weak in consequence, that an hour after it was bound up she was unable to walk without assistance.

About this time it was that one of the many surgeons who attended upon the case proposed removing the parts by the knife, describing a large area on the leg around and considerably beyond the disease with his finger; this was objected to, and evidently most wisely, by the two professional gentlemen just alluded to; they preferred the removal of the limb, rather than hazard so uncertain an operation, and urged its adoption at once,—the fear being at the time that the patient might sink if a second bleeding took place during the night. Other long-established practitioners also, in after consultations, agreed in the necessity of the removal of the limb for the ultimate object of saving the patient's life.

For a month after this profuse bleeding, upon every removal of the applications, it bled slightly from the under edge of the appendix; but in a few days after the great hæmorrhage, the aneurismal spot itself again subsided to the level of the skin.

Some twenty months since, after kneeling, the knee and leg swelled, and turned black in spots as if pinched. The following morning some active bleeding came on, wetting through the linen and roller, but nothing to be compared to the former, since which no bleeding of any consequence has occurred; but the leg has gradually increased to its present state, spotted all over with purplish cutaneous veins, with immense enlargement, and particularly about the outer as well as the inner ankle, and spreading to the foot, which it so involved as to leave but little trace of natural shape.

In way of remark, it may be observed that the disease in question is in its nature somewhat anomalous; though decidedly of that description which John Bell was the first so accurately to describe under the head of "aneurism by anastomosis," in some respects it has the feature of fungus hæmatodes, but nothing whatever, in the most distant degree, of the *mere* varicose vein.

In so enlarged and distorted a state of the limb, relative situation of parts is in a great measure disturbed, if not wholly lost; but still the situation of the aneurismal spot, one would say, is just within the inner edge of the peronæus muscle, and the outer edge of the tibia; that is, just over and about the tibial artery and vein: a most suspicious circumstance, for, from the *erectile* nature of the aneurismal substance, as proved by the history of the case, there can be no doubt but that a highly vascular and spongy tissue of considerable extent must form its basement. In such a neighbourhood, to what extent, and how formidably supplied by blood-vessels, is the question. Great uncertainty and risk would, therefore, necessarily attend the dissecting out, or, rather, *the attempt* to dissect out, such a disease; and the surgeon, as well as the patient and others, must be all prepared for the possible, if not probable, immediate amputation of the limb to save life in case of failure.

Treatment.—Dec. 19. The fig-like appendage was left as a gauge to show how far the vascularity of the aneurismal spot and its basement was affected under pressure; otherwise, had it been deemed prudent, a ligature might have been applied to its pendulous neck.

The general restoration of the limb to health was, however, the first object; for this purpose the foot, heel, ankle, and leg, were accurately rolled, at least as well as the great irregularities and enlargements of the parts admitted; active purgatives and calomel in alterative doses were prescribed.

25. Rolling has been followed up; at times interrupted by occasional swellings of the foot, &c., at night. However, gradual increase of pressure has still been persevered in, and the limb to-day presents a re-

markably-improved state, both as to size as well as the diseased and discoloured appearance of the skin and its veins. The pain she used to suffer has almost subsided, especially from the aneurismal spot down to the inner ankle, where the enlargement was deeply discoloured; all this is now nearly removed, and the enormous bulk outwardly above and over the ankle and foot is also strikingly reduced. Very active pressure employed; the purgative plan continued; health improved.

After the second application of compression, the aneurismal spot and appendix were placed under the pressure of plaster straps; to these, additions have been made, and over them a firm, graduated linen compress has been included in the application of the rollers.

Jan. 3, 1840. Very active pressure has been kept up from time to time since last report; no pain or swelling have occurred. To-day, upon the removal of all the rollers, the limb appeared considerably smaller than the other leg; above the ankle, where it was so enormously enlarged, a full inch less by measurement than the other leg, the integument loose and flaccid.

Specific pressure employed over the aneurismal spot and fig-like appendix by graduated compress paper and plaster straps; the former strap applications not being removed, and the whole limb placed under very active pressure, but more especially over the immediate disease by the further employment of linen compress and the firmest rolling, the pressure being gradually carried up to the uttermost drawing the hand and arm could use, assisted also by the knee. In this process of the treatment, pins were used as fixed points to confine the specific pressure to the part, and prevent ligature on the limb.

12. None of the plaster straps have been removed, so that the immediate state, either of the aneurismal spot or appendix, has not been ascertained. No pain or inconvenience of the part has been experienced; but evidently a diminished circulation to a great extent has been effected, from the different sensation felt by the patient herself, as well as the total disappearance of large vessels beneath the integument, which formerly were seen passing along the upper and outer part of the leg to the thigh, some inches above the aneurismal spot.

19. To-day, on attempting to remove the plaster straps, the fig-like process was unfortunately dragged, which caused considerable irritation to the aneurismal spot, and which, from a perfectly quiescent and reduced state, rose frightfully up on the instant, giving a dreadful sensation of tearing and bursting of the whole limb.

This circumstance, which gives a tolerable reproof to those who would, in their simplicity, treat such a case as a *nothing*, precluded anything like further inspection, and the parts were immediately placed under the control of the compression: this was cautiously and gradually increased over the aneurism to a maximum height, and in the course of less than a minute all the dreadful sensation and pain subsided.

Feb. 23. So much amendment in the case, that reapplications are now only made once a-week. No inconvenience experienced in the limb; the cuticular veins have altogether disappeared: and the patient observed, "that it was a long time since she enjoyed such health as she now feels." Active pressure kept up.

March 1. Walked into town five miles to have the applications made; and more than a fortnight since the patient walked ten without the slightest inconvenience. Before the treatment, could not walk half a mile without being ready to drop from pain. Upon the removal of the pressure immediately over the aneurism, the parts have now none of that filling, bursting sensation, which formerly always attended upon every such removal; this sensation has entirely subsided the last three weeks. Active pressure continued.

April 12. To-day all the straps were removed, and particularly the two between which the neck, as well as part of the process, were included; part of the surface had been slightly abraded, and from it a small discharge had issued, staining the rollers immediately in contact. On removal of the two straps from above and below the neck of the process, the two blood-vessels passing through it into the body of the process soon began to fill and swell up the part, which before appeared quite flattened, thin, and apparently bloodless; the small abraded surface became covered with minute scarlet points, and blood, quite of an arterial character, soon began to drop freely and fast from it, but not attended with any jet. During all this, the aneurismal spot itself remained flat—indeed, concave in its surface. Before the reapplication of the compression which was immediately made over the part, some two ounces of blood fell upon the carpet; after the application of the compress there was no stain of blood after the first coil or two of the roller.

May 10. The fig-like process, from the discharge and fœtor, would appear to be in a sloughing state; but all the applications immediately in contact were not removed from their adhesive state, and also, in consequence of the removal of a part, some oozing of blood took place; the remainder, therefore, were left, as there was no object for their removal, but, on the contrary, such would only encourage a return of circulation through the part by the absence of pressure.

23. The discharge on Saturday last was extremely fœtid, and the compresses in con-

sequence over the aneurismal spot were all removed, and in a part, also, over the fig-like process. To-day, the compresses had slipped down, leaving the aneurismal spot free from all pressure; but no filling of the part as formerly was at all perceptible; and, on the removal of all the compresses, the once fig-like process (or tongue) which had caused so much anxiety to the patient for years, on account of its frightful swellings and bleedings, was now found among the black, fœtid discharge quite disengaged; a mere dark, putrid mass, about the thickness of half-a-crown; a small pedicle of the elongated neck only remaining at the bottom of the aneurismal spot. The limb was placed under general compression.

30. The applications had slipped down to-day, so as to form a ligature across the aneurismal spot; but no swelling or rising of the under part took place, though the covering was of a dark purplish colour, evidently in consequence of the ligature. On the re-applications being made, more specific compresses and pressure were placed immediately over the aneurismal spot and pedicle. The limb had remained perfectly easy and comfortable during the week, though the last few days the patient had suffered from an old spasmodic stomach complaint, for which remedies were prescribed.

June 4. All the applications removed, and still more active pressure used in the reapplications. The stomach attack less the last few days.

12. The whole of the applications removed, and the remaining pedicle or neck appeared in a sloughing state, giving out the same putrid discharge as the fig-like process did when in a state of slough. Active compression over the aneurismal spot and pedicle continued; and which is effected, including the whole of the leg and foot, by three five-yard rollers; formerly thirty-three yards required to be used. The patient's general health much improved.

July 19. The covering integument of the aneurismal spot and appendage this day presented a perfectly smooth and delicate cuticle, marking the progressive change going on from the last report.

Aug. 9. The cuticle over the spot and appendix rough and scaly. In speaking of the former state of the diseased leg, as compared with its now wonderfully changed condition, the patient described the effect of cold, at times, as well as heat upon the disease; and observed, "that people, even medical gentlemen themselves, who only saw it in its quiet state, could have no idea of its frightful swelling and alarming appearance at times;" and named an instance, "the winter before last, after being long exposed to cold, of the sudden and enormous swelling of the leg itself (holding both her hands out with extended fingers in a cradle-like form, to show the size of the limb, and which would have taken in the body of a well-grown child of two years), as well as the rising of the aneurismal spot in a frightful mass of several inches—so frightful, that her mother as well as friends were distracted and alarmed, and ran out of the room, thinking it would burst."

Jan. 10, 1841. Since the last minute the parts gradually subsided into a state of health, and the compression diminished to mere rolling, sometimes the patient applying the rollers herself. About six weeks back, the limb was tested by a desperate fall in consequence of her patten catching an iron railing, which threw her violently on the side and bruised her dreadfully. The leg was swollen and discoloured outside, and the veins enlarged; but no appearance of enlargement or pain was felt about the part, which was once the seat of so formidable a disease.

Feb. 21. Since the last report the leg had been seen but once, the patient managing the rollers herself, which are now employed chiefly for the recovery of the integument of the outer ankle, which formerly was so enormously distended, but which has now nearly recovered its natural state; the leg otherwise being in a perfectly healthy condition, the patient observing, "I really think it stronger than the other." To-day's report also affords the gratifying confirmation, that throughout all the late extremely cold and boisterous weather the limb has remained in every respect perfectly easy and unaffected, though the patient has been much exposed and out in all weather. So far, then, as testing the case in almost every possible way, by extremes of heat and cold, and severe straining and bruising as well as strong exercise, it may be said to be entirely a successful one. The patient is in excellent health.

The entire command of the compression treatment over the "aneurism by anastomosis," which has so often proved fatal in children, commonly known by the title "mother's marks," has been also proved, since the one so cured in 1828 and 1829, in the instance of Mr. Kennerley's child, the engraver and artist of London. This was a frightfully formidable case of considerable bulk and height, and situated upon the windpipe. One of the pressure plates used in this case the author has now by him; it measures full two inches across, and nearly as much in diameter; made up with tea lead and plaster straps to the thickness of three-quarters of an inch, and is of the firmest texture, the internal plaster bearing the marginal mark of the aneurism.

Before it came under the treatment of compression, a consultation was held upon the case by Messrs. Lawrence, Vincent, and Stanley, surgeons of St. Bartholomew's Hospital, who declared the fatal nature of the disease, and the little, if any, chance of

saving life even in the attempt at removing it by the knife. Some four years after (1833), the author was met by the uncle of the little patient, who told him she was grown a fine bouncing girl, and with scarcely a visible mark left of the former disease.

Six years ago it was the intention of the author to have given *a series* of cases to THE LANCET, but severe and protracted illness prevented him from accomplishing this object. For the present, however, he trusts that these minutes will be sufficient to awaken the serious consideration both of the profession and the public. Other cases, formidable in their nature and highly interesting, are now going on successfully under the treatment.

TINNITUS AURIUM.

To the Editor of THE LANCET.

SIR:—Tinnitus aurium, one of the most distressing symptoms to which persons with impaired hearing are liable, is at the same time one of the most difficult to remove. When it is considered that tinnitus is a symptom indicative of various morbid conditions of the parts engaged in the function of hearing, some of which are diametrically opposite the one to the other, as I shall presently show, it will be evident that much attention and discrimination will be requisite to trace it to its real source, and to apply the proper treatment. Tinnitus is dependent in almost every instance on constitutional causes, and can rarely be even alleviated by any measures, which are not directed to improve the general health. It occasionally accompanies a diseased state of the cerumen; this secretion being either in excess, or else greatly deficient. It is also occasionally found as the precursor of apoplexy, in which case the noises are heavy and dull; the other symptoms, which are present, will indicate the nature of the case to the experienced physician.

The following extract from a work on the Preservation of Hearing by M. Schmulz, of Dresden, with a copy of which I was presented by the author when I was in that city, will show the importance of this symptom, and the annoyance which results from its presence:—

"Le bruissement est en général une incommodité aussi pénible qu'opiniâtre, qui trouble, du moins au commencement, la pensée, et absorbe l'attention du malade, vu que celui-ci l'y porte involontairement. Parmi les indispositions, auxquelles nous sommes sujets, il est du nombre de celles, que le temps et l'habitude adoucissent le moins. Les personnes, qui en souffrent, tombent presque toujours dans une profonde tristesse, et le bruissement les tourmente souvent beaucoup plus que la dureté d'oreille, aussi long temps, du moins, que celle-ci n'a pas atteint un trop haut grade. Du reste, c'est par ce symptôme que commencent la plupart des affections de l'ouïe dont nous allons parler, et c'est très souvent la première marque, à laquelle on reconnait une maladie commençante de cet organe."

Tinnitus aurium is generally symptomatic of a disordered and weakened state of the general nervous system, more especially of the ganglionic apparatus, when the auditory nerve suffers in common with other parts of the body; under such circumstances, the disordered appetite, the irregularity of the circulation, as evidenced by the state of the pulse and palpitations of the heart; the impairment of the other sensorial functions, as vision, smell, &c., the secretions being generally imperfectly performed, and the manifest derangement of the whole nervous system, will sufficiently indicate to the cautious observer the proximate cause of the symptom I allude to. The predisposing causes are, intemperance, irregularity of living, profuse discharges, depressing passions, and, in short, whatever will weaken the frame, and greatly diminish or exhaust the nervous power: whatever will improve the general health, impart energy to the nervous system, and tone to the frame, will be of service in removing this variety of tinnitus. With this view, I have prescribed a combination of the arnica montana root combined with valerian and cinchona, administered twice a-day: I commence with three grains of the arnica, and gradually increase the dose to seven. The quantity of valerian and cinchona will, of course, be regulated by the symptoms; an infusion of the arnica with cascarilla and valerian has been occasionally employed, and with equal advantage: under its use, the general health has improved, the appetite has become better and more regular, the patient has acquired strength, and the distressing nervous sensations, including the tinnitus, have gradually disappeared. The arnica is a remedy which has been admitted and expelled, and readmitted and re-expelled the pharmacopœia, chiefly, I believe, because its utility was not sufficiently known. It was formerly called doronicum Germanicum. It has been used in fevers, particularly of the intermittent kind, and in gangrene, in which cases it is said to have been as efficacious as cinchona; a remedy of such importance should not be allowed to fall into oblivion. The neglect with which it has been treated, has probably arisen from the fact that its use is not attended in many instances with any sensible operation, although it occasionally causes vomiting, diaphoresis, or diuresis; Haller says, that even gutta serena has yielded to the powers of this medicine; I have occasionally employed the lactate and citrate of iron in these cases, and have reason to be much pleased with the results. These preparations of iron I prefer to those in ordinary

use, as they are less liable to affect the head.

Dr. Linke, of Leipsic, is of opinion, that tinnitus aurium affecting the left ear only is connected with a diseased condition of the liver; and he told me that the results of the cadaveric examinations he had instituted confirmed him in his opinion. He had not been able to trace a similar connection between tinnitus of the right ear and that viscus. My own opinion is, that tinnitus is dependent on a disordered state of the ganglionic or trisplanchnic system of nerves, and to be removed by attention to the general health, improving the secretions, and restoring the tone of the system generally. In this opinion, I am happy to say, I am supported by Dr. Carus, physician to the King of Saxony, and by Dr. Boehm, physician to the principal hospital at Berlin. The following extract on aural neurology, from a work by Dr. S. Pappenheim, of Breslau, in Silesia, which was recommended to me by Dr. Carus, contains, as I think, some useful information respecting the ganglionic condition of the nerves of the internal ear:—"The nerves of the internal ear are the nervus acousticus, the portio intermedia Wrisbergii, the anastomosing branch of the facialis and acousticus; the branches of the auditory nerve, viz., the nervi cochleæ and vestibuli, the ampullaris saccularis, &c.; which last forms a small ganglionic swelling, from which three bundles spring, which, according to their situation, are divided into a superior, middle, and inferior. The auditory nerve is cerebro-spinal in man and the domestic animals only. The anastomosing branch of the facialis and acousticus is provided with a ganglion in the ox, and consists of many ganglionic globuli. This branch may be traced backwards, and isolated as a small stem in the sheath of the acoustic nerve: it springs from the acoustic and passes to the facialis, where it is enlarged by additional fibres. The nervus cochleæ is totally covered on its upper surface by a broad reddish-grey stratum, which consists of ganglionic globuli. The nervus vestibuli has, particularly on its posterior and outer surface, a reddish ganglionic substance. The nervus modioli contains ganglia in the human subject."

After the distinct account I have given of the symptoms and treatment of tinnitus, it cannot be necessary, in alluding to a few cases, to do more than give a brief outline thereof.

Elizabeth Lumbless, ætat. 62, a nurse, has been annoyed with tinnitus for five years, accompanied with nervous deafness. Her health generally is out of order, by attending to which, and by the use of the arnica for three weeks, she got rid of the noises, and her deafness was much lessened.

Thomas Wright, ætat. 66, has been afflicted with tinnitus for some time, but cannot say for how long: was a sergeant in the 44th regiment of foot, and served with Abercrombie in Egypt, where he was wounded. The same remedies afforded him decided relief.

Rebecca Garden, ætat. 40, a widow with four children, troubled with deafness and tinnitus ever since she lost her husband, about three years since: the noises are so troublesome, she cannot sleep at night; is very much out of health, but the catamenia are regular. She was cured of her deafness by the measures usually adopted at the dispensary; but the noises continued, and were ultimately removed by the use of aperient medicines, conjointly with arnica.

A young lady from the city, affected with tinnitus, in consequence of the death of her brother by drowning, is very low spirited and hypochondriacal; the catamenia irregular; has been under medical treatment, but in all probability without attending to directions. In this case the lactate of iron was administered in conjunction with the arnica; the health gradually improved, the catamenia returned, and my interesting patient, I am happy to say, got well.

Captain S., ætat. 42, a free liver, has been a good deal abroad; attributes his affliction to a cold caught on leaving a warm bath. He was cured by an infusion of arnica, one drachm to six ounces, with tincture of columba, of which he took three tablespoonsful three times a-day. I remain, &c.

John Harrison Curtis,
Surgeon to the Royal Dispensary for Diseases of the Ear.

2, Soho-square, Aug. 26, 1841.

MALIGNANT DISEASE OF THE PENIS.

To the Editor of The Lancet.

Sir:—The case of malignant disease of the penis which you inserted in your Journal of July 31, page 655, has turned out differently to what I anticipated, although the appearances then were most favourable, the wound after amputation having healed perfectly in three weeks. It was on the day after I sent you the report of the case that he complained of violent pains in the inguinal glands, which soon enlarged, and went on rapidly to ulceration, and the whole left inguinal region is now one frightful mass of fungoid ulcers; he emaciates very fast, and is rapidly sinking.

I have thought it well to send you this statement for those of your numerous readers who may have read the case as reported before. I have the honour to be, Sir, your obedient servant,

Thomas Bancks.

Stourbridge, August 18, 1841.

SUMMARY AND RESULTS OF

THREE HUNDRED RECENT CASES OF VACCINATION.

To the Editor of THE LANCET.

SIR:—I beg leave to offer you a summary of my first three hundred vaccinations under the recent Act. They were performed between the 1st of January and the 19th of June, in the present year; and though their number is too limited to warrant any conclusions which are at variance with those that have been drawn from a more extensive series of cases, it is possible that many who feel a special interest in the subject of vaccination, may be glad of even this small contribution to its statistics.

The principal point illustrated is the influence which is exerted upon the success of the operation by the age and sex of the patient, and by the date and condition of the inserted lymph.

Of the whole 300 cases, 232 were successful, and 68 unsuccessful; the proportion of success to failure being about 3½ to 1. Other particulars are shown in the following tables:—

Sex of the Vaccinated.	Successful.	Unsuccessful.	Total.	Proportion of Success to Failure.
Male	117	31	148	4 to 1 (nearly)
Female	113	39	152	3 to 1 „
Age of the same.				
Birth to 2 months	37	26	63	1½ to 1 (nearly)
Above 2 to 6 months	46	21	67	2 —1 „
„ 6 to 1 year	22	2	24	11 —1 „
„ 1 to 2 years	61	3	64	20 —1 „
„ 2 to 7 years	54	8	62	7 —1 „
„ 7 years	12	8	20	1½ —1 „
Date (or Age of Inserted Lymph.				
Fifth day	12	1	13	12 to 1 (nearly)
Sixth day	49	6	55	8 —1 „
Seventh day	44	8	52	5½ —1 „
Eighth day	109	27	136	4 —1 „
Ninth day	7	2	9	3½ —1 „
Tenth day	5	5	10	1 —1 „
National Vaccine Establishment—(date unknown)	6	19	25	One-third „
Freshness of Lymph.				
Moist (fresh)	211	38	249	5 to 1
Dry	21	30	51	Two-thirds.

From the above analysis it would appear:

1. That males are more susceptible of vaccine infection than females.

2. That the susceptibility (in either sex) increases regularly from birth until the second year of life, after which it gradually diminishes.

3. That the activity of lymph is greater when taken on the fifth day of the disease, than when taken at any later period—diminishing, indeed, with remarkable regularity, from the fifth to the tenth day.

4. That the lymph is 7½ times more certain of succeeding when fluid than when dry.

5. That fluid lymph taken on the fifth day, and applied to a patient in the second year of life, hardly ever fails.

Various other circumstances which I have noted, but have not found leisure to tabulate, such as the comparative efficacy of puncture and incision (or scratch); the frequency of success in retro-vaccination—(Bryce's test); irregularities in the vaccine vesicle; the occurrence of sympathetic vesicles locally or generally, and the subsequent appearing of vaccinoid eruptions, I hope to have an opportunity of alluding to more particularly in some future communication. I am, Sir, your most obedient servant,

FRANCIS A. B. BONNEY.

Brentford, Aug. 25, 1841.

CASE OF CANCRUM ORIS.

To the Editor of THE LANCET.

SIR:—I was called July 24, 1841, to Edw. E——, æt. 18 months, and found the little patient feverish, hot skin, fœtid breath, tongue furred, and fœtid saliva flowing profusely from the mouth; several excoriations and ulcerations of the gums and roof of the mouth, one on the hard palate being nearly half an inch in length and two lines in breadth, and of a dark bluish tinge; the molar teeth being much decayed. I ordered him to take four grains of compound scammony powder every night and morning; and a fourth of the following mixture every four hours:—

℞ *Dilute sulphuric acid*, gtt. x;
Tincture of bark, ℥j;
Syrup, ℥iss. Water sufficient for an ounce mixture. Borax and honey to be applied to the ulcerations, &c., freely.

25. The bowels had been relieved copiously three times, very offensive, the head not so hot, the ulcers much the same, had taken no nourishment, and appeared wasting. Continue the medicines, and take beef-tea, &c.

26. Certainly better; the ulcerations looking healthy and florid; bowels open twice; evacuations more natural; breath and saliva less offensive, but still profuse; and takes sago, &c.

27. Still improving; saliva decreasing in quantity, and ulcers healing fast; bowels open. To take two grains of the compound scammony powder night and morning, and continue the mixture. He went on from this time gradually improving till July 9th, when I pronounced him well.

Remarks.—The blue tinge, I apprehend, might be explained by the gentleman who attended before me having given calomel, for the child had been ill for ten days before I saw it; and we see in this case the value of aperients combined with the use of tonics.

STUDENS GUYENSIS.

SPURIOUS LABOUR PAINS. EFFECTS OF UTERINE IRRITATION.

To the Editor of THE LANCET.

SIR:—The remembrance of the following interesting case of labour will be of much service to me in practice, should such another occur. Believing that there are many young practitioners like myself, who are glad of practical information, if you think it worthy of publicity it is at your service.

Mrs. P., a poor woman, residing in Gray's-inn-lane, the mother of three children, was seized with irregular uterine action on Wednesday, the 7th of July; in consequence of which I was called to attend. On making an examination, I found the vagina relaxed, and well lubricated with mucus; the os uteri was high in the pelvis, and rigid, being dilated to the extent of half an inch in circumference, through which, during a pain, the membranes were distinctly protruded; presentation natural. Under these circumstances I left word that I should be sent for when the labour came on. In about four hours I was called a second time: the pains had been severe and constant during my absence, yet no progress had been made. At this time a pain of more than ordinary severity came on, during which she fainted. The usual means to rouse her were assiduously applied for a quarter of an hour, without the least success. Slight convulsions began to be apparent; pulse full, and breathing rather laborious. A small basin of blood was taken from the arm: after waiting half an hour, and finding her still insensible, with the paroxysms of convulsions becoming very violent, a larger quantity of blood was taken away, making from both bleedings above two pounds. Ten grains of calomel were put on the tongue, and a brisk enema thrown into the rectum. After twenty minutes she was completely roused, and had a free evacuation from the bowels. I waited an hour, and finding her continuing free from convulsions, though still complaining of severe pains, I ordered an opiate, and went home. I was disturbed at six o'clock next morning: on my arrival at the house, I learned that the uterine action had been severe during the whole night; that the convulsions had returned occasionally; that the waters had come away; and that the bowels had been moved with the calomel: not the least progress had been made, although, as the women said, "she had been in strong labour all night." As she was beginning to be exhausted from want of rest, and the continued annoyance of these ineffectual pains, I gave her a second opiate, from which she enjoyed a few hours sleep. After this the pains returned for some hours, but towards night left her altogether, and in a day or two she was going about as usual, and kept pretty well, till Friday, the 20th of August, when, after a quick and easy labour, she gave birth to a fine girl, being more than a month after her two days' sufferings from spurious labour pains.

This case affords a good example of the propriety of judicious delay in manual interference. During her second day's illness, Mrs. P., and a conclave of sympathising friends, urgently demanded that something should be done for her relief; but considering that there was no hæmorrhage, that the os uteri was high in the pelvis, hard, and but little dilated, and that the convulsions

had nearly ceased, it was obvious that there was no symptom indicating the least risk to life: their entreaties were accordingly firmly resisted, and Mrs. P.'s mind quieted with the assurance that there was no danger, and that proper labour had not commenced, and probably would not come on for a week or two.

W. C. M'E.

August 23, 1841.

REPORT OF THE DEPUTATION

FROM THE

BRITISH MEDICAL ASSOCIATION

TO THE

ANNIVERSARY MEETING

OF THE

PROVINCIAL MEDICAL AND SURGICAL ASSOCIATION, AT YORK, AUGUST, 1841.

Exeter Hall, August 17, 1841.

THE deputation consisted of Dr. Webster, Dr. M. Hall, and Mr. Bottomley (Croydon), who were very courteously received by the President and members of the Provincial Association, and cordially welcomed by the other deputies—Professors Maunsell and Williams from the Medical Association of Ireland, and Dr. Brown from the North of England Association.

Though little opportunity occurred for consultation previous to the general meeting, yet the greatest unanimity of opinion existed among the delegates of these associations. The object of each, acting on the instructions received from their councils, was to promote medical reform particularly, and the welfare and respectability of the profession generally, by endeavouring to form a plan of active co-operation with the Provincial Association, and with each other.

Your deputation had, at their request, been favoured by the secretary of the Provincial Association, with copies of the report of the council, from which it appeared that erroneous statements had been conveyed respecting the proceedings of the London Medical Conference to the "Worcester Council," by "*some of the delegates*" appointed by that body; and that certain resolutions, founded on their misrepresentations, had been passed by the council, which appeared to place the acts of the conference in an improper light. Previous, therefore, to attending the general meeting, we pointed out to the secretary that as the conference had been called together at the suggestion of the British Medical Association, it was particularly incumbent on us not to allow any misrepresentation of its proceedings to pass unnoticed, and that if certain passages which were read were allowed to stand as part of the report, that the deputation must oppose the report, and move that some parts be expunged, or at least that such an explanation must be given as would set the matters referred to in their true light.

The parts of the report alluded to [illegible] cil [illegible] some o[illegible] ceived from the commencement, from [illegible] ates [illegible] the delegates, *were not satisfactory*.

2. That they represented that the dele[illegible] of the Provincial Association *were a minori[illegible]*

3. That a bill was passing, clause by clause, which *involved the destruction* of existing institutions.

4. That by the 22nd of February (the conference having commenced its sittings on the 3rd), Drs. Macartney, Forbes, Cowan, and Green, *wished* to resign their offices, leaving only two delegates at the conference.

5. That, therefore, the council did not consider the Provincial Association pledged to support the Bill which might have passed the conference, and that the resignation of the delegates be accepted, and that no others be appointed.

It appeared to your deputation that very erroneous inferences were likely to be drawn from the foregoing statements, because—

First. As to the delegates of the Provincial being a minority, it may be asked if they were expected to be a *majority*, or *more numerous* than *all* the delegates of the nine other associations who sent deputations from England, Ireland, and Scotland; but it is a fact, that of the twenty-five delegates who were appointed from the whole associations, fifteen were members of the Provincial, and of these thirteen were on its council.

Secondly. No Bill, or clauses of a Bill, were passed at the conference, nor attempted to be passed: the heads, drawn up by Dr. Webster, and printed *at the request* of the Southampton committee of the Provincial Association, were by general consent read, and occasionally made use of, in considering the leading principles of medical reform, in the absence of any other document.

Thirdly. The opinions arrived at by the conference, as published in THE LANCET of February 27, *do not involve the destruction* of existing institutions, and were agreed to almost unanimously by the delegates.

Fourthly. There seems to have been some mistake about the resignation of the provincial delegates. Dr. Forbes, it was understood, withdrew in consequence of receiving a public appointment. Dr. Cowan *had not resigned* when the provincial resolutions were read at the conference, for he afterwards attended the deputations and the College of Physicians. Drs. Macartney and Green resigned *simultaneously*, after a resolution of the latter, according to instructions from the Worcester council, *in favour of the corporations, had been negatived*. It was, however, evident that Drs. Macartney, Cowan, and Green, could not with propriety have remained longer at the conference, as

they considered themselves to be the representatives of the Worcester council *only*, and were directly opposed to most of the liberal opinions of their colleagues, Dr. Forbes and Messrs. Wickham and Ceeley, who stated that *they* represented the Provincial Association, not the Worcester council.

Fifth. The opinions and resolutions of the conference, as laid before the three corporations, were agreed to, previous to the resignations of *any* of the provincial delegates, though the contrary might be inferred from the resolutions of the Worcester council.

The foregoing remarks are rendered necessary, because on attending the general meeting at York, your deputation found, when the report of the council was read, that some of these statements had been expunged, and others so far altered, that they did not consider it necessary to disturb the unanimity of the meeting by formally opposing the report; but the report had been sent to three hundred and twenty-seven councillors with the above statements, and no notice has been taken in the official account of the meeting, and of the explanation given in a speech of one of your delegates.

The report of the reform committee of the association was read by Dr. Barlow. It inculcated, as on several former occasions, the propriety of separating the qualification of the medical practitioner from the union, government and regulation of the profession. "If competency and uniformity of qualification, then, be the main requisite for insuring to the public well-instructed practitioners, it is obvious that some legislative enactment is needed for accomplishing this end; the *existing institutions, as at present constituted, being wholly incapable of effecting it: while, owing to their number and diversity, they admit not of being in any way modified so as to attain it.*" "Your committee are not unaware that the same statute which ordains the establishment of a NATIONAL EXAMINING AND LICENSING BOARD, might also unite in ONE CORPORATE BODY the collective profession so constituted, and empower it to conduct its own internal government by a REPRESENTATIVE COUNCIL OR SENATE; but being of opinion that pressing for the latter would endanger or retard the more essential purpose, it is their earnest recommendation that this be *exclusively* pursued until it be accomplished."

The report considered that further petitions to Parliament would be unsuitable and fruitless, as they could only legislate on Bills submitted to them; that the difficulty was to get such a Bill prepared as would pass; that ardent reformers, if intrusted with framing such a Bill, would seek too much; existing corporations, on the contrary, would concede too little. It therefore concluded by recommending that some party, untrammelled by either extreme, should frame a Bill, and that a memorial be presented to the Secretary of State for the Home Department, praying the ministers of the Crown to undertake this duty.

The deputations from the associations doubted the propriety of this course, particularly at the present ministerial crisis, at least they thought the subject ought not to be left to *any ministry* without specific recommendations from the profession; and they considered that a joint committee should be appointed by the provincial and all the reform associations with sufficient funds at its disposal, and with powers to communicate with the Government, or to take such steps as might be necessary in the ensuing session of Parliament.

Dr. M. HALL said, he doubted the policy of entrusting medical reform to the ministers of the Crown who might seek for their information from the existing corporations. The precise end and aim of medical reform could be expressed in one word, and that word was INCORPORATION—an incorporation of the profession into ONE FACULTY OF MEDICINE, comprising *all its members*, and extending over the *whole* of the British dominions, securing to each and all an honourable title (it might be "member of the faculty"), with equal rights, privileges, and immunities, and equal protection. He thought that that could be done without interfering with existing institutions, except in a salutary manner, by forcing them to raise their qualifications and enhancing their honour. To incorporation, he would add the correction of all abuses in the colleges, so that all qualified physicians and surgeons might be admitted to their respective fellowships *without invidious distinctions*. He would deprive the Company of Apothecaries of the power which they ought never to have possessed of examining medical practitioners, though he wished to bear testimony to the benefits they had conferred on the profession, but in future he would confine them to their own department—the regulation of chemists and druggists and the sale of medicines.

Dr. WEBSTER did not oppose the adoption of the memorial to Government, though he expected no good to result from it: it was so much time wasted to apply to the present ministry; and from a correspondence he had had with Sir Robert Peel, he very much doubted whether he could or would entertain the question during the coming session; if so, he feared that no measure would be obtained which could be satisfactory even to his friend Dr. Barlow and his colleagues of that association. After an interview which the conference had with the three corporations, he ridiculed the idea of *waiting for their reforms*, or expecting any thing from their advent. He alluded at some length to the official reply of Sir H. Halford from the College of Physicians, and to the opinions expressed by Mr. Guthrie and Mr. White,

that the College of Surgeons was perfectly immaculate in its constitution and actions; that it was a pure college of surgery, and that it had nothing to do with medicine, midwifery, or pharmacy. He then noticed the changes contemplated by the corporations who had evidently united their strength to preserve and extend their exclusive privileges, and thought that after the late resolutions of the Worcester council in favour of these bodies (which, however, had not been responded to), some declaration of the reform principles of the association ought to be made. He would submit to the meeting a few simple and plain propositions which might be added to the memorial to Government as the basis of the measure which they sought for, or, if the meeting preferred it, they might be adopted as their reform creed. Dr. Webster then dwelt on the great importance of at once obtaining a plan of representative government for the profession; he had always had the misfortune to differ from his friend, Dr. Barlow, *as to the order* in which the two great divisions of medical reform should be sought for. Dr. B. thought if *uniform qualifications* were obtained, good government and every other blessing must necessarily follow; while he (Dr. Webster) contended that uniform qualifications, efficient examinations, and a high state of respectability, would inevitably result from *incorporation*, and a council representing and carrying out the wishes of the great body. As his colleague, Dr. Hall, had dwelt with so much effect on this point, and had so well expressed his own sentiments on the subject, he would at once read his propositions, leaving them to the meeting to be disposed of as they should think fit.

"That this association will promote any measure of reform founded on the principles of—

"1. QUALIFICATION—that is, competent acquirements, both preliminary and professional (to be tested by efficient examinations), of all who shall enter the profession.

"2. REGISTRATION of all legally-qualified medical practitioners.

"3. INCORPORATION of the whole profession (legally-qualified) into one general faculty of physic, with equality of rights and privileges.

"4. REPRESENTATION and government, by a council in each kingdom, to be elected by the votes of the commonalty or members.

"5. REGULATION of the practice of pharmacy."

Dr. MAUNSELL in an able speech seconded these propositions, and supported them *seriatim* at some length, pointing out the urgent necessity of a better government and better qualification of the profession. He and his colleague attended the present meeting on the part of the Medical Association of Ireland, to consult with them in the most friendly spirit, and particularly to endeavour to arrange some plan of effective co-operation in the common cause of the profession, which, it was now universally acknowledged, laboured under heavy grievances in both countries. Though he supported the propositions of Dr. Webster, he also concurred in the report of the Reform Committee, and in the memorial founded upon it; but he wished particularly to impress upon the present meeting the necessity of proceeding from deliberation, to *action*. What he wished to propose was the formation of a *responsible* committee, which should co-operate with other bodies in the profession, both corporations and voluntary associations, and a portion of which might be in London when matters were going forward there of importance to the profession. In making this proposal, he did not mean to undervalue the services of the council, but he desired a committee having the protection of the profession for their especial duty, and responsible for the performance of that duty; such a committee could communicate with the Government, and prevent them from seeking all their information from the corporations. It should also be directed to frame a Bill for the regulation of the profession in union with other bodies, and by laying such Bill before the Government, enable them to act in conformity with the prayer of the memorial. This was an essential step, and was also the only possible mode of ascertaining the sentiments of the profession; such a Bill, in fact, if properly drawn, would be a series of propositions upon which the views of men might be tried. There were many other matters which required the services of such a committee;—for example, the approaching discussions upon the Poor-law Amendment Bill; and if it were entrusted with funds, he was sure that by acting firmly and with decision it would be effectual in obtaining speedy justice for the profession.

Professor WILLIAMS supported Dr. Webster's propositions, and the views of his colleague, Dr. Maunsell, at considerable length.

Dr. HASTINGS said, that after listening attentively to the debate, he thought it would be the wiser step for them to adopt the recommendation of the committee, and memorialise the ministers of the Crown. He considered that they should confine themselves to the simple objects recommended in the report—that of *qualification*, and not to risk the loss of all their objects by striving for too much in seeking for *incorporation*, &c.; he for one was not sanguine of any speedy settlement of the question of medical reform.

Dr. BARLOW assured the meeting that Dr. Webster's propositions had at some time or another been fully recognised in the reports of the reform committee and in the resolutions of the association: he still thought qua-

lification should be sought for separately from incorporation of the profession, and he hoped Dr. W. would withdraw his propositions for the sake of unanimity.

Mr. HARE, of Leeds, though of a different opinion when he entered the room, was convinced from the debate of the importance of an incorporation of the profession; he proposed that the discussion should be adjourned till the following day, to admit of a conference being held between the deputation and the reform committee, to organise a plan of co-operation. This appeared to meet the views of the meeting and the deputations; but it was opposed by Dr. Hastings on the plea of the impossibility of the debate, as so much business remained to be transacted.

Dr. WEBSTER, after some further discussion, withdrew his motion, on the understanding that the propositions were recognised by the association, and the memorial was adopted without reference to the formation of a committee.

Your deputation have thought it best to give an outline of the debate that you may draw your own inferences from facts.

The next day the deputation met to consider what further steps, if any, they should take. Two points were now evident.

First. That the Provincial Association (or rather its officers) would not take up the question of medical reform at present on the basis of incorporation of the profession and a representative government.

Second. That they were not desirous of an active co-operation with other associations, nor of appropriating a portion of their funds for promoting the various questions connected with medical reform.

The deputation then had an interview with Dr. Hastings and Dr. Barlow, and urged upon them strongly the importance of a more active co-operation than had yet taken place; and that unless this were done, they could scarcely suppose that the Provincial Association were in earnest in the cause. It was said by these gentlemen that a ready intercourse and communication *had* always existed between their reform committee and the other associations, which was still open; that they thought this would be quite sufficient for future purposes; and that Dr. Barlow, as chairman of the committee, would be most happy to continue this intercourse. To this it was replied, that *communication* was not *co-operation*: that on former occasions Dr. Barlow had *felt and expressed* that *he had no power to act*,—that now something more should be attempted, and that the application to the Government which had been resolved on must be *followed* up, whether the ministers of the Crown undertook the question or not; and that caution and hesitation should have its bounds, else it would issue in a neglect of duty.

They stated that they wished to get a joint committee *appointed* or *recognised by the general meeting* of the association (in any way most agreeable to its officers), with sufficient powers *to act* with other bodies; that instead of the deputations proposing this to the general meeting, they thought it would be better that such a joint committee should be recommended by the council, as the deputations felt assured it would be carried if proposed in this way. Dr. Hastings thought this might be done; but Dr. Barlow doubted whether such a proposition would be well received by the general meeting, and after much discussion nothing definite was agreed to.

On this the deputations retired, to consider if anything further should be attempted, as they felt their functions ought to cease if the objects of their mission were not supported. It was then agreed to address a letter to the president, so as to obtain an official reply: this was accordingly drawn up, and signed by the deputies of the three associations. It stated the objects for which they had attended at York; the result of the interviews with Dr. Hastings and Dr. Barlow, and asked "whether the Provincial Association would appoint a responsible committee, and invest them with powers necessary for effective co-operation, both in deliberation and action, with the bodies which the deputies respectively represented." It added, "that the co-operation referred to does not relate to medical reform *exclusively*, much less to any particular plan of reform, but to the protection of the profession in relation to the poor-law and various other grievances, and to the support of its general interests and respectability."

Before presenting this letter, Dr. Brown, of Sunderland, suggested that another attempt should be made to convince Dr. Barlow and Dr. Hastings of the importance of acceding to the wishes of the deputies; but after considerable discussion the result was as fruitless as before. Eventually the letter was not presented for fear of disturbing the unanimity of the general meeting, which was then drawing to a close, but the deputies held a conference, and passed the following resolutions:—

"York, August 5, 1841.

"At a conference of the delegates from the British, the North of England, and the Irish Medical Associations, to the anniversary meeting of the Provincial Medical and Surgical Association, it was agreed,

"First, That the delegates should report to their constituents respectively, that having attended and taken part in the proceedings of the general meeting of that body on the previous day, and having given their best consideration to the subject, they deemed it unadvisable to make any specific proposition at the meeting for the purpose of procuring its co-operation through the medium

of some official channel appointed for that purpose. Further, the delegates were informed by the secretary, that it would not, in his opinion, be desirable that such a proposition should be made at the present meeting. The secretary and the chairman of the reform committee of the association also stated that a free intercourse had hitherto existed between the reform committee of the Provincial Association and the associations represented by this conference of delegates, which, in their opinion, would be sufficient at the present time.

"Second. As it appeared essential to the best interests of the medical profession to *organise a plan of co-operation* between the different associations founded for medical reform, it was unanimously agreed that the fullest and free'st intercourse between their councils be recommended for the purpose of promoting measures for the good government and regulation of the medical body.

(Signed)
"J. Brown, Sunderland.
"H. Maunsell, } Dublin.
"Robt. C. Williams, }
"George Webster, Dulwich, for self and
"Marshall Hall, London.
"George Bottomley, Croydon."

Your deputation having discharged what they considered to be their duty, and having closely adhered to facts in this report, deem it unnecessary to add one word of comment.

(Signed)
George Webster.
Marshall Hall.
George Bottomley.

THE PRESENT

MEDICAL ARRANGEMENTS

AND

RECORDS OF BETHLEM HOSPITAL.

To the Editor of The Lancet.

Sir:—Dr. Monro dies and makes no sign. I am sorry for it. He partially rallied from the first attack, but the production of the authentic records of the hospital have overwhelmed him, and he has sunk without a struggle. We will chaunt his requiem in the following extracts from the Parliamentary Report (page 525), which may partly account for his disorder:—

"Each of the physicians, in the regular course of duty, visits the hospital twice in the week; Dr. Monro on Wednesdays and Saturdays, at one; Dr. Morison on Mondays and Thursdays, at ten. The usual duration of Dr. Monro's visits is about one hour and a quarter, and sometimes much longer."

"The duration of Dr. Morison's visits is from one to four hours, and upwards."

Seventy-five minutes twice a-week, divided amongst *one hundred and fifty* patients, giving an average of *one minute* per patient per week! There is much quiet sarcasm in the following observations of the commissioner:—"The whole of this time is spent in visiting or prescribing for his patients, *which, from habits of accurate arrangement*, founded on an experience of twenty-three years within the walls of the hospital, *Dr. Monro has found amply sufficient for all useful purposes.*

The publicity which this matter has now attained, must force the subject upon the consideration of the managing committee, when they return to their duties, after their three months' summer recess; there cannot, therefore, be a more fitting time for a general revision of their medical arrangements, and especially that portion of them which relates to the record of restraints. We glean from the letters of "Philanthropos," the Parliamentary Report, and the Report of the two *eminent* physicians, the following facts, namely, that a regular record of all restraint, specifying its nature, duration, and cause, is now kept at the hospital, and that this record is regularly laid before the sub-committee at each weekly meeting, with the certificate of the two physicians attached, that all the restraint imposed during the week has been necessary. We learn, moreover, that each physician sees his patients on *two* days only out of the *seven*, and consequently can have no personal cognisance of what takes place in the hospital during the remaining *five*; so that his signature of approval is weekly attached to numerous cases of temporary restraint, varying from one hour to three days, upon hearsay merely, and to cases of consecutive restraint for the whole week (sometimes continued uninterruptedly for many successive weeks), upon a short personal inspection upon two of them only. This self-evident but painful truth is well illustrated by the case of Mr. Shelly, reported upon by the two eminent physicians. During two successive weeks, as we learn from these authorities, commencing on the day when he struck the steward, and terminating on the day when he was discovered by Mr. Serjeant Adam[s]

in the dark cell, he is reported in the restraint-book as having been occasionally confined to his cell, and such restraint-book has the usual signatures of the two physicians; but he was never, during the whole period, once seen in such cell by any medical officer of the establishment, resident apothecary included!

What terms of reprobation are sufficiently strong to characterise such a system of mischievous delusion? Where is the man, medical or non-medical, who for one short summer has been connected with a lunatic asylum, and watched with common care the habits of the patients and the characteristics of the disease, who would not treat such documents with the most ineffable scorn? And what must be the opinion of the medical officers of the watchfulness and sagacity of the committee, when they weekly venture to present such documents to their notice? It is, sir, as impossible to ascertain upon Wednesday that an insane patient required restraint on the preceding Tuesday, as it would be to trace out the figuring of the idle loiterer on the sands of the sea-shore, when the next day's tide has rolled over its surface.

And now let the physicians take warning: sooner or later a searching inquiry will be made into the medical treatment pursued in every asylum throughout the empire, BETHLEM NOT EXCEPTED. Up to the present time they may have affixed their signatures to these returns without thought, from long-continued habit, and perhaps from a notion that the act was ministerial only; but they have now full knowledge that the blot is hit, and if they value their medical reputation, let them be careful how they continue the practice. The following imaginary examination may become a real one, at an earlier period than they probably anticipate:—

Committee, April 1, 1842.

(Drs. MONRO and MORISON called in.)

5430. You are joint physicians of Bethlem Hospital?

We are.

5431. You have, I believe, made a report that the abolition of restraint in the treatment of the insane is a gross and palpable absurdity?

We have.

5432. The wild scheme of a philanthropic visionary?

Words to that effect.

5433. I presume, then, that restraints are not abolished in Bethlem?

Not wholly; but they are as much reduced as is consistent with the welfare of the patients and the safety of the attendants.

5434. Does this statement appear in your report?

It does.

5435. You keep a record of the patients placed under restraint?

We do. (The book was produced, and handed in.)

5436. I observe that your signatures are attached to the weekly summaries, certifying that the restraints imposed have been necessary?

We do this by the express order of the committee, before whom these returns are laid weekly.

5437. What means do you possess of ascertaining the necessity of the restraints imposed?

Partly our own personal attendance upon the patients, and partly the information given us by the apothecary, steward, matron, keeper, or nurse, as the case may be.

5438. Do you, then, certify that restraint has been necessary in cases in which you have not seen the patient under restraint?

Constantly.

5439. What proportion do the cases coming under your own personal knowledge bear to the cases dependent upon hearsay?

We cannot exactly say; but an inspection of the restraint-book will show. Dr. Monro is personally cognisant of all restraints inflicted between the hours of one and three on Wednesdays and Fridays, and Dr. Morison with those inflicted between ten and two on Mondays and Thursdays; the residue we derive from hearsay.

5440. That is to say, each of you is personally cognisant of all restraints during six hours in each week, and each of you take from hearsay the propriety of those inflicted during the remaining one hundred and fifty-six?

Exactly so.

5441. Do not cases sometimes occur in which the restraint is continued day and night, not only for a whole week, but for many weeks consecutively?

They do.

5442. Does this system extend to such cases?

It does.

5443. That is to say, you certify that restraints are properly imposed for *seven days and nights consecutively*, and so on, from seven days to seven days, when intervals of three days elapse in which you do not see the patient at all, and when you never see him beyond a few minutes at a time.

We do.

5444. Is it possible for any medical man, however splendid his talents or extensive his practice, to form a competent judgment of the propriety of restraining a patient, unless he personally attends him; and are you justified, under the circumstances above drawn forth, as medical men, in affixing your signature to the weekly returns, or declaring (see your answer to Questions 5433 and 5434) that restraints are as much reduced in Bethlem as is consistent with the welfare of the patients and the safety of the attendants?

The reply to this and the subsequent embarrassing questions must be deferred until the witnesses are examined before a competent tribunal; I cannot undertake to answer for them.—I am, Sir, your obedient servant,

A LOOKER-ON.

August 30, 1841.

P.S.—It is not my intention to meddle with the case of ROBERT DAWSON; but there is a singular confirmation in the Parliamentary Report of one part of his account of the medical treatment pursued in the hospital, which leads to an inference that other parts of his account may not be wholly without foundation. On the day of a patient's admission, when he goes to bed "he receives," says DAWSON, "an aperient powder, and is immediately locked into his cell. By three or four next morning this operates freely, for which he is provided with a wooden bowl; but what is his disgust and indignation, on being unlocked at six or seven, to find he has to empty and clean this bowl, and then directly wash his hands and face in it." "It is usual," says the Parliamentary Commissioner (p. 525), to administer an aperient powder to each patient on the night of his admission, *unless contrary directions are received from the physician*;" and this powder appears by a foot note to consist of "*calomel*, three grains; *rhubarb*, seventeen grains." Who would believe in the existence of such barbarisms in a royal English hospital in the middle of the 19th century—a standing order, that *every patient, whatever age, sex, constitution, condition, or habit of body, shall swallow, upon admission, a fixed quantity of calomel and rhubarb*, unless a special order to the contrary be given? It would be curious to inquire into the number of special exemptions which have been claimed and allowed from this stupid remnant of bygone days, out of the fourteen hundred patients admitted during the last five years. How can men of the character and reputation of Drs. Monro and Morison tolerate such absurdities!

SENSE OF TOUCH IN THE TONGUE.

To the Editor of THE LANCET.

SIR:—Sir Charles Bell, in his Bridgewater Treatise, when speaking of the sense of touch, and the beautiful apparatus in the extremities of the fingers (the elastic cushion) for increasing that sense, observes, "That it has been laid down by an ingenious gentleman, that the pulse cannot be felt at the wrist by the tongue." He then adds, "That it is a remarkable fact, that the soft structure of the tongue is not calculated to convey the sense of touch." This assertion is not true, for the pulse can be felt most sensibly by the tongue in two ways; in the first place by condensing, or causing contraction of the muscles of the tongue, and then applying it to the pulse, or by pressing the wrist gently upon the tongue in its uncontracted state. I have tried it upon myself and several other persons, and I was able to feel the pulsation of the radial artery almost as plain as with the finger, after the tongue had remained upon the pulse for a few seconds. When the work first appeared, I forget the opinions of the press upon several passages in it, which are not borne out by fact, and I shall feel much obliged by your opinion upon this passage. I remain your obedient servant,

R. DAVIS, Surgeon.

1, Worship-square.

LITHOTOMY.—A great cause of mortality after the different operations for stone is the escape of the urine by the wound. This has formed the great objection to the high operation; after which, as there is no depending opening, the irritating urine is more apt than in the lower to insinuate itself and lodge among the neighbouring parts: but in the lower operation, too, it has often been either directly or indirectly the cause of death.—*Dr. Arnott's Essay.*

THE LANCET.

London, Saturday, September 4, 1841.

THE time has arrived when the thoughts and attention of a numerous class of our readers will be directed with anxiety to a long-anticipated and eventful moment, but with what different feelings! The readers of whom we speak are fathers and sons; fathers who have tracked the course of their children with watchful care, and who are now about to consign them, perhaps alone and unprotected, to the temptations and dangers of the metropolis; sons who are looking eagerly forward to a long vista of fancied enjoyments, mingled with the graver cares and hopes of successful application to their studies. At such a moment a few brief remarks upon the important subject to which we have alluded may be acceptable.

In pursuing the studies necessary to success in the medical profession, three considerations especially present themselves to our inquiry,—these being, physical education; moral education; intellectual education. It is difficult to say which of the three deserves to occupy the first place in the mind of the teacher and of the taught. All are most necessary; none is indispensable; and each would be entirely useless if isolated from its fellows. Without the physical education which should conduce to the well-being and health of the body, the moral and intellectual man would be weak and tottering. Without moral education the individual must fail in his profession, and be spurned by his fellow-men,—a scourge upon society. Without intellectual education, those living springs could not be opened which stream forth with knowledge and ability, which give confidence to the practitioner in the hourly duties of his calling, and which confer a blessing and a source of unspeakable comfort and happiness upon the pain-stricken sufferer.

The subject of physical education has been adverted to very recently in our pages, on the occasion of a notice of a pamphlet written by the Rev. Mr. NORTH, chaplain to St. George's Hospital. Mr. NORTH describes what he considers would be the advantages which would arise to the students of medicine in London, were they placed on a similar footing with those of the Universities, and submitted to collegiate restrictions and regulations: and, in truth, no part of the term of medical education is more deserving of the attention of parents and of young men themselves. Of the position of the medical student in London, Mr. NORTH observes:—

"As contrasted with the member of the university, he is in a larger town, in a far more mixed society (for, with few exceptions, gownsmen do not associate with the inhabitants of the town), less liable to observation (for the academic dress constitutes a mark of distinction and recognition), exposed to greater risks in every way, while all the restraints which exist in the one case are wanting in the other. To this we may add, that the course of previous education has already prepared the schoolboy for the ways of the university; already has the school afforded him a miniature (and in some instances far more than a miniature) picture of the university, so that the transition in the case of one leaving a public school is very slight: in which respect the medical student is very differently placed. Take, for example, the case of one who has been removed from school at the age of fourteen or fifteen, for the purpose of being apprenticed to a practitioner in the country; and this is, I believe, a very general course. What superintendence has been exercised here? What pains can have been bestowed upon the moral culture, or the formation of the principles and habits, of a youth thus situated, by a master whose unavoidable absence from home extends frequently to the whole of the day, and whose intercourse with his apprentice is thus necessarily confined within the limits of mere professional commands on the one side, and obedience on the other? Yet, with no other preparation than this, it is that perhaps the majority of students are sent to encounter the difficulties and temptations of a London life: a preparation, surely, which by its incompleteness suggests how essential to the welfare of this class some friendly direction, some mild system of control, must be."

Setting aside the question of health and comfort, and the system of regularity which must necessarily be engendered by a well-

arranged domestic system, we should deem its results as equally conducive to the mental education of the student. It is vain to expect that the mind can be free to engage in the exercise which is necessary to the full appreciation of the various subjects of medical study, if the brain be wearied and weakened by late "hours," by the social excesses of companionship, or by the cares originating out of an uncomfortable domestic position. But the inconveniences to which the student thus falls the victim do not terminate here, they extend their contagious influence to all with whom he may associate, and not only to his fellow-students, but even to those who might be thought to be most distant from his sphere. This truth has not escaped the observation of the writer whom we have previously quoted, for he exclaims :—

"How powerfully do the conversation, conduct, and habits of life of the students who throng the wards of the hospital,—how powerfully must they act upon the nurses and servants, and (though somewhat less directly) upon the patients within the walls! Indeed, the indirect advantages which would in all probability arise from having a body of pupils whose persons were well known, whose characters were observed, whose excesses were animadverted upon, whose regularity was encouraged; I say, the indirect advantages probably to be derived from a body of students thus disciplined are exceedingly numerous."

In fact, every source of distraction likely to flow out of the unprotected position of the medical student in London should be removed from his path by those upon whom the responsibility of his education devolves. But at present that responsibility is confined to the parental roof alone. On his arrival in the great Babylon of temptation, no guardian but his own disposition exists, and excellent though that disposition be, it may not always be sufficiently firm to withstand the allurements spread before him in every shape. In some cases the evil might be corrected by adopting the suggestion of Mr. North, viz., furnishing a building attached to the hospital, and by appropriating the various apartments to the students, appointing a warden to preserve good order therein. With one exception, no hospital provides for the accommodation of its students. King's College receives a limited number of students within its own walls. But we are not aware that any restrictive regulations exist there. In all the schools, teachers and hospital officers will be found who receive pupils into their families; but the number that can avail themselves of this assistance to their comforts is necessarily small.

We have already endeavoured to show that much of the student's success must be attributable to the domestic position which he may occupy during his residence in London; and we need scarcely add, that a large share of the parent's solicitude is, or ought to be, directed to this point. The experience of practice must prove to every medical officer, both in town and country, that excellence is a part of the individual, and professional merit may be so equally balanced in the London Schools, that no real advantage might arise from a selection of this or that establishment, in preference to others; excepting, indeed, in so far as situation and size are concerned. The most popular school will frequently be found the worst, from being that which includes the greatest number of idlers, or is so thronged by those who are anxious to study, that many must be necessarily disappointed. It is obvious that the proportion of disease spread before the student in the wards of a hospital must be nearly similar in all; that the plan of treatment enjoys the same general average; but that when the number of observers is few, and the means of observation are well arranged, the greatest, the most unrestricted opportunities for the student exist: for to himself, and to his own individual perseverance and investigation, he must look for the acquirement of a solid knowledge of his profession.

The subject of the moral education of the medical student is highly important. The dearest interests of families are often confided to his trust. He is the friend, the adviser, the confessor; and cruelly, indeed,

would that trust be repaid, were his moral sentiments deficient and untrained. The vilest robber of the property of society, walks innocently and uprightly before the man of education, and especially the medical man, who could, under any circumstances, breathe but to the winds the facts which must come before his daily notice. It is in reference to the training which this responsible position demands, that moral education, in relation to medicine, should be steadily pursued. And it is not the least of the gratifications which originate in our profession, that we should be regarded by society with confidence and respect.

Mental education embraces a field of inquiry too extensive for our present consideration. No profession demands so much and such varied information at the hands of its members, and continued study and application will alone enable the student to acquire the knowledge of all the departments of medicine, which is necessary for satisfactory and successful practice.

Three Memoirs on the Development and Structure of the Teeth and Epithelium, read at the Ninth Annual Meeting of the British Association for the Encouragement of Science, held at Birmingham in August, 1839; *with Diagrams, &c.* By ALEXANDER NASMYTH, F.L.S., F.G.S. London: Churchill. 1841.

MR. NASMYTH has done good service to the cause of physiological science by the publication of the papers entire, which have given rise to so much discussion in the medical and scientific world. The public has now a direct means of judging of the merits and of the discoveries of the author, without having recourse to the isolated paragraphs which have already appeared in the journals, or of exploring the voluminous twaddle of the *friends* of the council of the British Association, in order to reach the important and toil-gotten facts of more humble, and, be it remembered at the same time, of more useful workers in the field of science. We were much tempted in penning the title of the above work to have written "The British Association for the *Discouragement* of Science;" and truly upon mature thought, as far as medical science is concerned, that would have been the proper designation for the conclave of drones of which its council is composed, or rather we might say, of insects of the ichneumon tribe, whose busy, buzzing life is alone occupied in exploring the stores of their fellow-insects, and sucking from them their contents in order to figure as constellations among the British "*savans*," and in the facile pages of the reports of the association. It would be asserting too little to say, that the council of the British Association has suffered very much in its reputation for uprightness and conscientiousness in the estimation of the medical world; for it may be unhesitatingly declared, that the presentation of discoveries in medical science to such a body has ceased to be respectable. No independent, honest, but humble, worker in the paths of truth, would now venture into such slippery hands, without placing a sealed copy of his labours in the keeping of one of our recognised scientific bodies, viz., of the Medical and Chirurgical, or of the Royal Society, to be preserved in the minutes of such society, in order to repel the depredations of pilfering ichneumons. How truly do we want an honest and upright board of science in this country, one in which admission should be regulated by labours alone, at whose portals nepotism and worldly interest might knock in vain; but it cannot be, we are and we shall remain, as Bonaparte well named us, a "nation of shopkeepers." Science and learning are made the scullery-maids of lucre. The scientific man is alone great when he is rich;—how often have we heard it exclaimed, "Ah! he is, no doubt, a man of great learning, of great intelligence, of enormous industry; but then, my dear sir, he's *poor*!"

In the preface to the work before us, Mr. Nasmyth has detailed the ungenerous treatment to which he has been submitted by the council of the British Association, prompted, as all the world believes, by the ignoble representations of interested and envious minds. But we need not detain our readers by reverting to circumstances already well known to them, and a lasting stigma on our scientific history. As soon as the discussion upon Mr. Nasmyth's claims was forced upon the attention of the council by the public voice, that gentleman offered to "re-exhibit all his original documents;" but this offer was refused by the committee ap-

pointed by the council to inquire into the matter of dispute, who declared with much *naïveté*, that they felt themselves "*incompetent*" to prosecute "the delicate physiological considerations" involved in the subject. Our readers will smile with good reason at the profundity of this *council of the* Association of *British savans*, who deem themselves "incompetent" to grapple with a physiological question of the most simple kind, as we shall hereafter show. We were much amused the other evening at seeing a group of schoolboys playing a "judgment-ball;" but this British Association game of bigger boys is still more laughable; the "incompetent" council, Professors Goggle and Smudge!! Ah! ah!!

But our author is not satisfied with this farcical show-up of the scientific *representative council of Britain*; he indulges a little harmless quizzery at the expense of the council of the College of Surgeons, "the *only constituted body of anatomists in this country*," as our readers will perceive in the subjoined paragraph.

"Surprised at the continued neglect of my offer above-mentioned, both by the council and committee, as also at the plea of incompetency to judge the matter set forth by the former, and at the singular misconception already alluded to in the report of the latter, I at length, in my earnest desire to afford the fullest satisfaction, and to place the whole matter on an unexceptionable and natural footing, offered to refer the question, whatever its precise nature may be, and *to submit the whole of my original documents to the president and council of the Royal College of Surgeons*, the only constituted body of anatomists in this country, and therefore the best tribunal for the decision of any physiological point; but strange to say, this proposition, like my original offer to Professor Phillips, has been passed over in utter silence."

We should almost be induced to fancy Mr. Nasmyth in right earnest in his appeal to the council of surgeons, did we not know him to be perfectly aware that that body is utterly incompetent to the duty which he would impose on them; that the expectation of a decision from them is absurd; that of the entire body, scarcely one is familiar with the present state of anatomical science; that one alone possesses a microscope, and knows how to pursue a microscopical investigation. As far as surgical science is concerned, we may, perhaps, look with confidence to the College of Surgeons, but we are quite assured that its council would be little disposed to entertain a question upon a branch of science (anatomy), on which scarcely two of the members of the council are perfectly agreed. Anatomy and the sister science Physiology, are penniless maidens; they offer no golden inducement to their wooers; they are won with pain, and retained only by care and toil. These are good reasons why they should not obtain a niche in the Royal College, whose well-attested motto is, "For fees we live."

We now proceed to an analysis of the memoirs before us, and as they contain much original and interesting matter, we shall leave nothing unnoticed which may appear to us likely to afford gratification to our readers, while to those who would possess themselves of a more complete knowledge of the subject, and of the nine beautiful plates which adorn the volume, we must recommend the work itself.

Our readers are aware that a tooth consists of three substances; of *enamel*, which forms a thin crust over the crown; of *ivory*, or tooth-bone, which constitutes the chief bulk of the tooth; and of *cementum*, or crusta petrosa, which invests the root of the tooth, and under certain circumstances forms a thin lining to, or completely fills up the cavitas pulpæ. The ivory or tooth-bone consists of fibre-like, undulating tubuli, which traverse a dense, interfibrous or intertubular substance. The intertubular substance has been described hitherto by our best anatomists, among whom may be named Purkinje, Retzius, and Müller, as uniform and structureless. But Mr. Nasmyth is "disposed to believe that it is not only organised, but so differently and characteristically so in different animals, as to be capable of affording valuable aid to the naturalist in classifying the animal kingdom." According to Mr. Nasmyth, the producing structure of the ivory, viz., the pulp, "is cellular throughout its entire structure;" the producing structure of the enamel, viz., the internal surface of the capsule, is also cellular; and the ivory and the enamel which are formed by a transformation of the pulp, and of the internal surface of the capsule, bear distinct traces of the cellular texture of which their basis is composed.

This important discovery, the originality of which cannot, we believe, be questioned, was made by Mr. Nasmyth in the inverse

order to that which we have adopted in describing its nature.

"My attention," the author observes, "was first drawn to the structure of the interfibrous substance on examining a delicate section of the fossil tooth of a rhinoceros, by the aid of a very high magnifying power, of one-tenth of an inch focal distance, and of the most perfect kind, with an achromatic condenser of light. The instrument with which I have conducted my researches, and upon the accuracy of which I place the greatest reliance, is that of Mr. Powell. In the section of the tooth of the rhinoceros to which I have just alluded, will be observed an appearance of cells or compartments;" an appearance which the author's subsequent investigations proved to be universal both in fossil and in recent teeth.

Mr. Nasmyth has also made researches into the structure and composition of the tubuli, which that gentleman terms "fibres," of the teeth of different animals. These he finds to

"Present an interrupted or baccated appearance, as if they were made up of different compartments,—an obvious concomitant of the cellular structure of the interfibrous material. The size and relative position of these portions or divisions of a fibre differ in various series of animals. In the human subject, for instance, each compartment of the fibre is of an oval shape, and its long, small extremity is in apposition with that next adjoining. The long axis of the oval corresponds with the course of the fibre. In some species of the monkey tribe, the fibre appears to be composed of two rows of compartments parallel to each other. In the orang-outan the fibre is composed of rhomboidal divisions, and in the baboon they are oval like those of the human subject, and the surfaces of the long axes are in apposition. In fact, each class of animals seems to have a distinct characteristic appearance, but all are similar in respect to the general baccated appearance."

Of the application of his views to practical purposes, the author remarks,—

"All systems of dental structure which have hitherto been propounded have failed, I think, to explain facts of daily occurrence; but they may be accounted for, I venture to assert, by the cellular organisation of the interfibrous substance which has been improperly termed structureless, and by the peculiar baccated arrangement of the fibres."

On the structure of the enamel, we read the following:—

"According to the views of Retzius, Purkinje, and the recent investigators of the structure of the teeth by the aid of the microscope, the enamel consists of fibres, running in a direction from the centre to the circumference of the tooth. On making a section of the enamel in a direction parallel to the transverse diameter of the tooth, the appearance as described by these writers is observed, and they are said to be seen to terminate in an hexagonal form beneath the investing crusta petrosa. If, however, a different section of the enamel of the human tooth be made, for instance, one near the surface, parallel to the vertical direction or long axis of the tooth, an appearance presents itself which has induced me to take a different view of the nature of the structure of the enamel. The section of the enamel presents compartments or divisions, but of a different character from those I have already spoken of as existing in the interfibrous structure of the ivory. Each compartment of the enamel is of a semicircular form, and the convexity of the semicircle or arch looks upwards towards the free external portion of the tooth."

With the first memoir we shall conclude our present notice, and on a subsequent occasion return to the two which remain. In the mean time, we may repeat that the small volume before us contains more original matter, and the fruits of more laborious research, than it is our lot to meet with commonly in the weekly prosecution of our literary duties.

EDUCATION IN THE COUNTRY.

To the Editor of THE LANCET.

SIR:—The faculty of the Bristol Medical School have recently had good ground to believe that which they had for some time suspected,—that great ignorance prevailed amongst the profession as to the degree in which the provincial schools are capable of qualifying for examination by the London boards.

A surgeon, attached to a public institution in this city, is known to have declined receiving a pupil, on the ground that a metropolitan education is required (as it was not long since) by the College of Surgeons.

I am directed by the faculty, therefore, to express the hope, that you will take the earliest practicable opportunity of directing the attention of the profession, through a short editorial article, to the fact that the provincial schools are on a footing of perfect equality with the metropolitan, in regard to their recognition by the examining boards in London. We are far from wishing you to recommend an exclusively provincial education; but we think that students ought to be

aware that they have their free choice, and that there are many advantages attendant on the prosecution of their early studies in provincial schools.

I may direct your attention to the fact that, at the last examination at the University of London, the *only three* gentlemen who went up from the Bristol school *all passed*, one of them in the first class; whilst of those who went up from the metropolitan schools, a large proportion were rejected.

As the session will so soon commence, we venture to hope that you will give early attention to this matter. I am, Sir, your very obedient servant,

WM. B. CARPENTER, M.D., Hon. Sec.

Kingsdown, Bristol, Aug. 27, 1841.

*** The publication of the above letter will probably serve the purpose of the Bristol faculty. It has always been contended by THE LANCET that as good a medical education may be obtained in the country as in London, and very often a much better. *The "atmosphere" is better in the counties.*

EXAMINATION

FOR

A MEDICAL DEGREE AT THE UNIVERSITY OF ST. ANDREW, ABERDEEN.

To the Editor of THE LANCET.

SIR:—Believing that it will be interesting to some members of the profession to know the nature of the examination for the degree of M.D. at the University of St. Andrew's, I beg leave to forward you the one I underwent on the 2nd of the present month. It consisted of three parts, or, rather, of three examinations, conducted by different professors.

The first was upon a passage of Gregory by the Professor of Humanity before the whole Senatus and medical professors; I was directed to read it deliberately, and then to translate it. After doing this I was requested to retire, and in little more than half an hour was called upon for the second part, which was commenced by Dr. John Reid, and concluded by Dr. Hannay, before a section only of the Senatus. When this was completed, I was again requested to retire.

In less than an hour from this time the third part commenced in another room by Professor Connell, and was concluded by Drs. Lizars and Robertson before the other section of the Senatus.

There were nine candidates for the degree, one of whom was rejected. The examiners were engaged from ten o'clock, A.M., to four, P.M.

These examinations partake, in some slight degree, of the character of public examinations, as the professors are occasionally in the habit of introducing their friends. I am, Sir, your obedient servant,

A GENERAL PRACTITIONER OF FIFTEEN YEARS' STANDING.

Professor GILLESPIE.

Denique, a longa et vehemente tussi, impedito per pulmonem sanguinis transitu, sanguis per venas refluit, imprimis ad caput; hicce vultus, ipsorum que interdum oculorum, rubor, et sæpe livor, et nonnunquam sanguinis profluvia, vel e naribus, vel ex vasis internis in ipso cerebro, et paralysis, aut convulsio, aliquando lethalia.

Drs. JOHN REID and HANNAY.

Where is the heart situated?

In what mediastinum?

How many cavities has it?

What are they named?

What are the vessels leading out of it?

Have they valves?

How many?

What are the nutrient arteries of the heart?

What are their returning veins?

Where do they discharge their contents?

What are the valves of the heart?

What quantity of blood is each cavity supposed to contain?

With what force is the heart supposed to propel its contents?

When is the stream of blood intermittent and when remittent?

What are the sounds of the heart?

By what is the first sound supposed to be produced?

By what is the second supposed to be produced?

What is the rhythm?

What is the covering of the heart called?

What is inflammation of this covering called?

Is pericarditis a disease easily to be detected?

What are its symptoms, general and auscultatory?

What are its consequences?

What effect has effusion into the pericardium upon the situation of the heart?

How would you treat pericarditis in its inflammatory stage, your patient being a person of full habit of body?

What means would you have recourse to for the purpose of removing effusion, the result of pericarditis?

What did John Hunter call that inflammation which glues the pericardium to the heart?

What do you understand by endocarditis?

What are its symptoms, general and auscultatory?

To what diseases are the valves of the heart subject?

What are the general and what the auscultatory symptoms of valvular disease?

What are the consequences of valvular disease?

What do you understand by pulmonary apoplexy?

Describe the appearance of the lungs after death from pulmonary apoplexy.

How would you distinguish the pulmonary apoplexy from hemoptysis?

What is pneumonitis?

What are its symptoms, general and auscultatory?

How would you treat it?

Who introduced large doses of tartar emetic for its treatment?

How did they administer it, and with what did they combine it?

In what doses would you administer it, and with what would you combine it?

With what would you combine it to lessen its irritating effect upon the mucous membrane of the stomach?

What is inflammation of the mucous membrane of the stomach called?

What are the symptoms of hypertrophy of the heart?

What are the symptoms of dilatation of the heart?

Professor CONNELL.

How are acids constituted?

What is the composition of sulphuric acid?

What are oxyacids?

Enumerate a few of them.

What are hydracids?

Enumerate a few of them.

What is the constitution of hydrochloric acid?

Its old name.

What are the elements of hydrocyanic acid?

How is it prepared?

In a case of supposed poisoning by it, what tests would you apply to discover it?

To what has its smell been compared?

What are the elements of cyanogen?

Is cyanogen a gas, fluid or solid?

What is the composition of the blood?

What are the elements of fibrine?

What is the constitution of serum?

What is the colouring matter of the blood called?

What is it supposed to be?

Professor LIZARS.

What are the bones of the hip-joint?

What are its ligaments?

What nerve supplies it?

Enumerate the muscles on the back of the hip.

What is the origin of the gluteus medius?

Where is it inserted?

What are the vessels on the back of the hip?

What are the nerves?

Where does the sciatic nerve come from?

Where does the internal pudic artery leave the pelvis?

Where does it re-enter it?

Of what artery is it a branch?

What vessels have you on the fore part of the thigh?

What nerves?

What is the relative situation of the artery to the symphysis pubis, and to the anterior superior spinous process of the ilium as it passes under Poupart's ligament?

What of the vein?

What of the nerve?

Of what artery is the profunda femoris a branch?

Is it given off to the outer or inner side of the artery?

What is that vein which opens into the outer side of the iliac vein just before it reaches Poupart's ligament?

How would you cut down and tie the femoral artery?

In performing this operation, what parts do you cut through?

Suppose you had amputated the thigh high up, and secondary hæmorrhage took place, what would you do?

Over what nerve would you apply a seton in disease of the hip joint?

Professor ROBERTSON.

What coat of the arteries is the most liable to disease?

What are the diseases of arteries?

At what period of life does ossification of arteries usually occur?

What arteries are most subject to ossific disease?

What are the consequences of ossification of the arteries of the brain?

What do you understand by an aneurism?

What is meant by true aneurism?

What by false aneurism?

Which vessels are most subject to aneurism?

What operations are performed for the cure of aneurism?

What is aneurism by anastomosis?

What is venous aneurism?

The methods of cure for these swellings?

What is the most approved treatment for varicose veins?

THE ST. COLUMB UNION TREACHERY.

Copy of a Letter addressed to the Editor of the "Cornwall Gazette."

"Penzance, Aug. 20, 1841.

"SIR:—In your last week's paper appeared an advertisement containing the resolutions passed at a medical meeting held lately at Launceston, in which the conduct of Mr. Bullocke and myself, in reference to

the St. Columb Union, has been very unfairly represented. The medical meeting to which I allude is the first half-yearly meeting of a *very few interested practitioners* (residing principally within the St. Columb Union), who call themselves the 'Cornwall Medical Association.'

"The true representation of the affair is the following:—The St. Columb Union, in March or April last, offered its resident surgeons 2*s.* 6*d.* for each case of vaccination, a sum considerably beyond what is allowed by the Penzance and many other unions. But this remuneration the resident surgeons, in a body, refused to accept, and united to dictate terms to the guardians. The board, therefore, had no alternative but to advertise for medical relief, and Mr. Bullocke and myself offered our services. My tender was precisely the same which had been previously offered by the board to the resident surgeons; and those very surgeons who are pleased to find fault with me for thus interfering with their attempt to coerce the guardians, actually tendered at the same time ten per cent. less than myself.

"I submit it, therefore, to the public to determine whether my conduct was not far more worthy of my profession than that of the associated resident surgeons in the St. Columb Union. I am, Sir, your obedient servant,

"EDWIN EDMONDS."

To the Editor of THE LANCET.

SIR:—I beg to call your attention to the above true copy of a letter from Mr. Edmonds, and the reply of the St. Columb medical committee, in the accompanying number of the *Cornwall Gazette* for August 27. I need hardly point out to you the miserable sophistry of Mr. Edmond's epistle, nor the expressions "dictate to and coerce the guardians." Moreover, it will be sufficiently evident to the profession, that it was not until we had discovered that there were amongst our medical brethren renegades and deserters, who were prepared and anxious to betray us, and to hand over the key of our otherwise impregnable citadel to our opponents, that we unwillingly consented to reduce our just demands. Having been attacked in front and flank and rear we are brought to bay, but we still hope that we shall present an impregnable phalanx, a square not easily broken by the conjoint attacks of those who, as *a public body only*, are opposed to us, and of two individuals to whom might be well addressed the words, and I quote not irreverently—"It was not an enemy that did this, but thou, mine own familiar friend, in whom I trusted," &c. &c. I am, Sir, your obedient servant,

J. H. NANKIVELL.

St. Columb, Aug. 28, 1841.

*** The letter in the *Cornwall Gazette*, of August 27, shows that as the Cornwall Medical Association enrols forty names, its members are not limited to practitioners in the St. Columb Union, but belong to every town in the county, and that its next meeting will be held at Truro, one having already been held at Bodmin, viz., in February last. The writers say that it is not true that in March or April last they were offered 2*s.* 6*d.* for each case of vaccination, but that 2*s.* 6*d.* was proposed to them in autumn 1840, and refused, and 3*s.* deemed barely sufficient. The guardians thereon postponed the question, and in the spring a tender was given in to them to take 185*l.* for the sixteen parishes. But this was refused, and 135*l.* offered to the medical gentlemen, and rejected; whereupon Messrs. Edmonds and Bullocke appeared as competitors. Upon that the board admitted the justice of the tender, by assenting to give the 185*l.* if the first parties would vaccinate at 1*s.* 6*d.* per case. Before, however, Mr. Bullocke's election, many too liberal deductions were offered by the surgeons, and all declined by the guardians. Then Mr. Edmonds tendered for 185*l.*, offering to vaccinate at 1*s.* 6*d.* per case, and Mr. Bullocke consented to take 124*l.* for the general relief, and 2*s.* for vaccination, per head; "and this offer, by a large majority of the board, was accepted: *and thus a union, comprising sixteen parishes, a population of upwards of sixteen thousand, covering an area of one hundred and eleven miles, the extreme points of which are from eighteen to twenty miles apart, having three large towns in it, was, and still is, intrusted to the care of one man:* a fact almost incredible, but nevertheless true." "And this tender was accepted," add the writers, "notwithstanding it was intimated to the poor-law commissioners and the guardians that he would have no assistance from either of us in any case which might arise."

There is no occasion to continue this controversy; Mr. BULLOCKE and Mr. EDMONDS may write till doomsday, cavilling and disputing about this little particular and that little particular. Unless they can wipe from off the record the monstrous fact which we have printed in *italics*, and disprove the allegation that one or both of them has brought to pass that startling iniquity to the poor, they had better be occupied in silently wearing their feet to the bone over the hundred and eleven miles, fulfilling conjointly *as much* of the union duty as is *possible*, than in sitting at home to attempt defences of indefensible proceedings.

NOTICE.—We are requested by Mr. Battley to state, that on the 30th of September he will exhibit, in the Great Hall of the Royal College of Physicians, by permission of the President and Fellows, samples of drugs, and of certain original and active preparations, which he invites the members of the medical profession to inspect; and that he will continue his analysis of these drugs, during the autumnal and winter months, at the Laboratory attached to the Ophthalmic Hospital, Moorfields. We are requested to add, that the subjects of analysis will be regularly announced in this Journal.

BOOKS RECEIVED.

State of the Lincoln Lunatic Asylum, 1841. Lincoln: printed by W. and B. Brooke. Pp. 79.

Researches into the Physical History of Mankind. By James Cowles Prichard, M.D., F.R.S. Third Edition. Vol. 3, Part I. Containing Researches into the Ethnography of Europe. London: Sherwood and Co., 1841, 8vo. Pp. 507.

TO CORRESPONDENTS.

Mr. George Butler, whose two replies, in relation to the operation performed upon him by Mr. Yearsley, appeared in THE LANCET several weeks since, has sent to us this week a satisfactory explanation of what seemed to be irreconcilable in those answers. So long a time has elapsed between the publication of the replies and the transmission of Mr. Butler's present statement, that it will be sufficient to take the above notice of his explanation, without publishing the letter containing it.

G. L. Beard.—There are plenty of schools in the American towns, but all of them distinguished by the worst as well as the best features of the English system. No person goes to America from England for a medical education, unless the local attractions of the former country are rendered superior to the emigrant by his particular circumstances. Many American students come to Europe for instruction. The details which our correspondent wishes to have we cannot give.

To the Editor.—Sir: In THE LANCET of Jan. 30th last appeared two letters, one from Messrs. Longman, the other from Dr. Copland, both having reference to the delay in the issue of the "Dictionary of Practical Medicine." In the latter document the writer, whose veracity and fair-dealing should run in right lines with his character as a physician, thus expresses himself—"I am now constantly engaged on the work, and shall have the 7th Part out *in a few weeks*." Seven months have elapsed since this announcement was made, and yet the 7th Part is unpublished: and it is the bounden duty, equally of the distinguished author and his respectable publishers, to lay before the subscribers a candid statement of their real intentions with reference to this long-protracted work. PHILALETHES. Dublin, August 26.

Mr. Searle's communication has been received.

If *Mr. Yearsley* really labours under any doubt as to the cause which induced our criticisms on his labours and declarations in the field of stammering, he may now learn what has long been quite obvious enough to every other man in the profession, namely, that his operations were denounced for their folly, their inutility, and their inhumanity, and his proceedings in relation to them for the character of quackery which eminently distinguished them. As to the reason for the "spiteful animus" which he has invented at page 9 of his circular "To the Members of the Medical Profession," he is honestly assured that we there learned for the first time that any "new weekly medical publication" was in existence which could possibly awaken "feelings of *rivalry*" (!), or any other feelings, in THE LANCET; or that Mr. Yearsley had ever "projected," or intended to execute, any "labours" in any periodical under the sun. If it be true that he is about to take the oar in a "new" journal, we pity the proprietor who admits him into the boat, which will only sink the sooner.

The letter of *Mr. Bodington* does not discuss the important point so briefly raised by "A Looker-on," upon a satisfactory basis. Moreover, the case of "A Looker-on" has not yet been stated, but only barely mentioned. Even, however, when it comes to be fully discussed, we shall not regard cases like those which Mr. Bodington relates, as germane to the question. Mr. B. has overlooked the fact, that our correspondent refers to the advantages of a numerous society in *well-conducted* public asylums. All of Mr. B.'s patients seem to have come from the most vicious quarters, and the worst managed company.

Scotus cannot attend, prescribe, and send medicines in *medical* cases, without being liable to prosecution. He might, by favour (not as a right), be admitted to examination for the licence, on certain conditions, the terms of which he could personally ask.

A Subscriber.—We have not the Act at hand, but if our correspondent procure it at the Queen's printers, he will probably ascertain that the clause declares that the medical visitor shall be a "legally-qualified medical practitioner." Probably the visitor in question came within the meaning of that term. The penal consequences of neglecting the directions of the law, are stated in the Act in their proper places. The asylum is a well-conducted establishment.

Showing the No. of Deaths from all Causes, Registered in the 5 Weeks, ending Saturday, Aug. 21, 1841.

Causes of Death.	July		August			Weekly Av. 1838-40, (corrected).
	18 to 24	25 to 31	1 to 7	8 to 14	15 to 21	
Small-Pox	14	14	9	10	6	36
Measles	15	24	15	19	18	24
Scarlatina	23	8	20	7	12	38
Hooping-Cough	26	31	37	41	30	28
Croup	3	3	4	5	6	7
Thrush	5	6	6	10	6	5
Diarrhœa	14	11	7	16	11	8
Dysentery	1	1	2	....	2	2
Cholera	....	....	1	1	6	1
Influenza	....	2	1	1	....	1
Typhus	19	21	23	19	21	46
Erysipelas	3	10	4	5	1	7
Syphilis	1	1	1	2	1	1
Hydrophobia	....	....	....	....	....	.1
TOTAL	124	132	130	136	120	204
Cephalitis	10	10	6	11	13	11
Hydrocephalus	41	44	37	28	29	34
Apoplexy	17	11	11	19	24	18
Paralysis	7	16	9	13	13	15
Convulsions	46	39	58	66	49	60
Epilepsy	1	2	2	2	6	4
Insanity	1	1	....	1	1	1
Delirium Tremens	2	2	1	2	1	1
Dis. of Brain, &c	8	11	6	12	9	7
TOTAL	133	136	130	154	145	151
Quinsey	1	2	1	2	2	1
Bronchitis	10	6	5	4	4	9
Pleurisy	1	2	....	....	1	2
Pneumonia	49	57	49	47	51	72
Hydrothorax	3	2	4	4	3	5
Asthma	6	7	13	9	8	24
Consumption	142	145	139	159	133	141
Dis. of Lungs, &c	8	12	8	8	12	12
TOTAL	220	233	219	233	214	206
Pericarditis	....	....	....	1	1	.6
Aneurism	....	....	....	1	1	.6
Dis. of Heart, &c	18	15	11	18	19	17
TOTAL	18	15	11	20	21	18
Teething	14	20	28	15	16	17
Gastri — Enteritis	21	30	30	14	28	18
Peritonitis	1	1	....	2	1	2
Tabes Mesenterica	6	2	5	6	9	4
Ascites	1	1	....	....	1	1
Ulceration	2	1	2	2	2	1
Hernia	1	1	3	2	1	2
Colic or Ileus	4	2	2	4	3	1
Dis. of Stomach	8	1	9	5	14	4
Hepatitis	....	1	2	2	2	1
Jaundice	2	3	1	2	1	2
Dis. of Liver, &c	10	8	11	10	10	7
TOTAL	70	71	93	64	88	60
Nephritis	1	....	1	....	....	.4
Diabetes	....	....	....	1	....	.3
Stone	....	2	1	....	1	.5
Stricture	....	1	....	1	....	.4
Dis. Kidneys, &c	1	5	3	5	4	2.4
TOTAL	2	8	4	7	5	4

Causes of Death.	July		August			Weekly Av. 1838-40, (corrected).
	18 to 24	25 to 31	1 to 7	8 to 14	15 to 21	
Childbed	6	8	2	7	3	7
Ovarian Dropsy	2	1	....	....	....	.2
Dis. of Uterus, &c.	4	....	5	4	7	2
TOTAL	12	9	7	11	10	9
Rheumatism	2	3	4	1	....	3
Dis. of Joints, &c.	4	1	2	2	2	3
TOTAL	6	4	6	3	2	6
Ulcer	....	1	....	....	....	.4
Fistula	2	....	....	....	....	.4
Dis. of Skin, &c.	1	1	1	1	....	.3
TOTAL	3	2	1	1	....	1
Inflammation	2	8	3	3	6	12
Hæmorrhage	1	2	4	3	1	3
Dropsy	25	19	32	31	33	34
Abscess	5	1	3	4	5	4
Mortification	6	5	2	4	3	5
Scrotula	2	....	2	1	2	2
Carcinoma	7	2	4	4	9	7
Tumour	....	3	1	2	2	2
Gout	1	1	1	1	1	1
Atrophy	8	10	13	12	8	4
Debility	27	18	14	19	20	15
Malformations	....	....	....	1	....	1
Sudden Deaths	9	12	10	17	6	13
TOTAL	93	81	89	102	96	103
Old Age	56	52	47	42	58	71
Intemperance	....	....	....	1	....	.6
Privation	....	....	....	1	1	.4
Violent Deaths	13	14	19	25	14	24
TOTAL	13	23	19	27	15	25
Causes not Spec.	6	1	3	2	2	8
Deaths, all Causes	736	778	759	802	776	926
No. of Week	29	30	31	32	33	....

1840—41.	Ages.		
	0 to 15	15 to 60	60 & upwards
July 18th to 24th	361	246	148
25th to 31st	410	242	136
Aug. 1st to 7th	372	265	121
8th to 14th	398	264	139
15th to 21st	368	213	164
Weekly Average, 1838—40	438	314	171

TEMPERATURE	High.	Low.	D. Mean.
Week ending July 21	74°	51°	60°
,, 31	71	52	60
,, Aug. 7	71	50	63
,, 14	73	51	63
,, 21	76	53	64

	Estimated Pop. 1840	July 18 to 24.	July 25 to 31.	Aug. 1 to 7.	Aug. 8 to 14.	Aug. 15 to 21.	Weekly Av 1838-40
West Districts	308,921	127	125	110	109	108	139
North Districts	414,458	130	147	132	148	132	163
Central Districts	369,722	136	150	138	170	142	190
East Districts	411,634	158	173	175	180	198	211
South Districts	450,265	185	183	184	186	196	223
	1,955,000	736	778	739	802	776	926